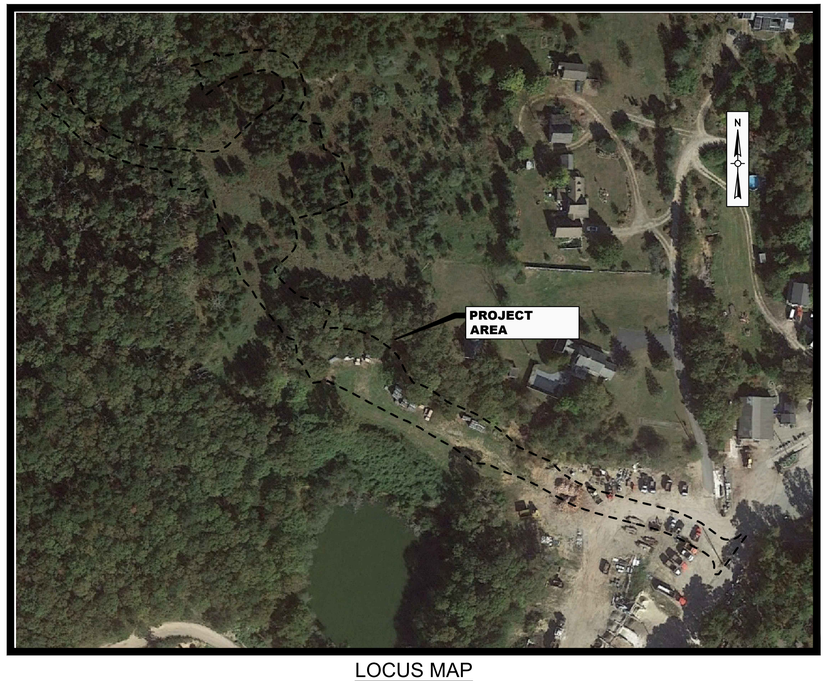
TOWN OF CHATHAM, MASSACHUSETTS

WELLS 10 AND 11 PUMPING AND TREATMENT DESIGN
CHATHAM WATER & SEWER DIVISION, 221 CROWELL ROAD
CHATHAM, MASSACHUSETTS, 02633

BID INVITATION # DPW-WATER WELLS 10 & 11.2022.23.3
PETER COCOLIS, SELECT BOARD CHAIR
THOMAS TEMPLE, PUBLIC WORKS DIRECTOR



LOCUS MAP
SCALE : 1"=100'

DRAWING INDEX

SHEET	TITLE
G000	COVER
G101	CODE SUMMARY
C001	NOTES AND LEGEND
C101	LAYOUT & MATERIALS PLAN
C102	GRADING & DRAINAGE PLAN
C103	DRIVEWAY PROFILES
C104	DRIVEWAY PROFILES
C105	PIPING & UTILITIES PLAN
C106	WELL DESIGN PLAN
C500	CONSTRUCTION DETAILS
C501	CONSTRUCTION DETAILS
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C503	CONSTRUCTION DETAILS
A011	ABBREVIATIONS, SYMBOLS, LEGEND AND GENERAL NOTES
A021	GENERAL NOTES
A101	OVERALL FLOOR & REFLECTED CEILING PLANS
A102	OVERALL ROOF PLAN & DETAILS
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DRAWING INDEX

SHEET	TITLE
I100	ABBREVIATIONS, NOTES, AND LEGENDS
I101	PIPING & INSTRUMENTATION DIAGRAM
I102	CONTROL DIAGRAMS I
I103	CONTROL DIAGRAMS II
M101	PROCESS PIPING PLAN
M201	CHEMICAL FEED SCHEMATICS
M501	PROCESS DETAILS
M502	PROCESS DETAILS
FP000	FIRE PROTECTION LEGENDS, NOTES AND ABBREVIATIONS
FP101	FIRST FLOOR FIRE PROTECTION PLAN (LOW LEVEL)
FP102	FIRST FLOOR PLAN FIRE FIRE PROTECTION PLAN (HIGH LEVEL)
FP501	FIRE PROTECTION DETAILS
P000	PLUMBING LEGENDS, NOTES AND ABBREVIATIONS
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P501	PLUMBING DETAILS
P502	PLUMBING DETAILS
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H000	LEGENDS, NOTES, AND ABBREVIATIONS
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H701	AUTOMATIC TEMPERATURE CONTROLS
E001	ELECTRICAL TITLE SHEET
E002	ELECTRICAL SITE PLAN
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E503	ELECTRICAL DETAILS SHEET III
E601	ELECTRICAL DIAGRAMS
E602	ELECTRICAL SCHEDULES SHEET 1
PV001	PROPOSED SOLAR PV LAYOUT PLAN (TO BE INCLUDED IN ADDENDUM NO. 1)
PV002	ELECTRICAL ONE-LINE DIAGRAM (TO BE INCLUDED IN ADDENDUM NO. 1)

Weston & Sampson SM

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Issued Date:

MARCH 30, 2022

811 Know what's **below.** **Call** before you dig.

COMMONWEALTH OF MASSACHUSETTS — LEAH E. STANTON — No. 36779 — REGISTERED PROFESSIONAL ENGINEER

Issued For:

BID

FILE NO. - - - -

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\\wes01\Local\WSEProjects\Mid\Chatham MA\Wells 10 and 11 - Pumping and Treatment Design\CAD\Cover Sheet.dwg

PARTITION LETTERING:

2 HOUR FIRE WALL - PROTECT ALL OPENINGS

1 HOUR FIRE WALL - PROTECT ALL OPENINGS

1 HOUR SMOKE BARRIER - PROTECT ALL OPENINGS

SMOKE BARRIER PARTITIONS - PROTECT ALL OPENINGS

APPLICABILITY:

- APPLY TO OUTSIDE OF FIRE RATED SHAFTS AND TO BOTH SIDES OF PARTITIONS AT INTERVALS NOT TO EXCEED 30'-0" FOR ENTIRE LENGTH OF PARTITION OR WALL OR TWICE ANY PARTITION 30'-0" IN LENGTH OR LESS. MINIMUM 15'-0" FROM EACH END OF PARTITION ALSO.
- LOCATE IDENTIFICATION IN ALL ACCESSIBLE FLOOR, FLOOR-CEILING AND ATTIC SPACES. LOCATE IDENTIFICATION WITHIN 12 - 18 INCHES ABOVE FINISHED CEILINGS
- APPLY STENCILED LETTERING BY SPRAY OR BRUSH OR PROVIDE PERMANENT SIGNAGE. IDENTIFICATION SHALL BE WATERPROOF, FADE-PROOF, AND NON-COMBUSTIBLE. SIGNAGE SHALL BE MECHANICALLY FASTENED OR PERMANENTLY ADHERED TO PARTITION OR SHAFT.
- STENCIL CHARACTER HEIGHT - 3" MINIMUM
- COLOR - EASILY IDENTIFIABLE COLOR, CONTRASTING WITH BACKGROUND ACCEPTABLE TO OWNER

1 CHAPTER 7 CODE RATED WALL LABELS
1 1/2" = 1'-0"

WARNING: THROUGH-PENETRATION FIRESTOP SYSTEM
- DO NOT DISTURB

NOTIFY FACILITY MANAGER / OWNER OF ANY DAMAGE

- *CONTRACTOR'S NAME, ADDRESS, PHONE NUMBER*
- *THROUGH-PENETRATION FIRESTOP SYSTEMS DESIGNATION OF APPLICABLE TESTING AND INSPECTION AGENCY*
- *DATE OF INSTALLATION*
- *THROUGH-PENETRATION FIRESTOP SYSTEMS MANUFACTURER'S NAME*
- *INSTALLER'S NAME*

PRESSURE-SENSITIVE, SELF ADHESIVE PRE-PRINTED VINYL LABELS

FOR ALL RATED WALL ASSEMBLIES, BOTH SIDES
- REFER TO "FIRESTOPPING" SPECIFICATION FOR ADDITIONAL INFORMATION

3 RATED WALL LABEL
1 1/2" = 1'-0"

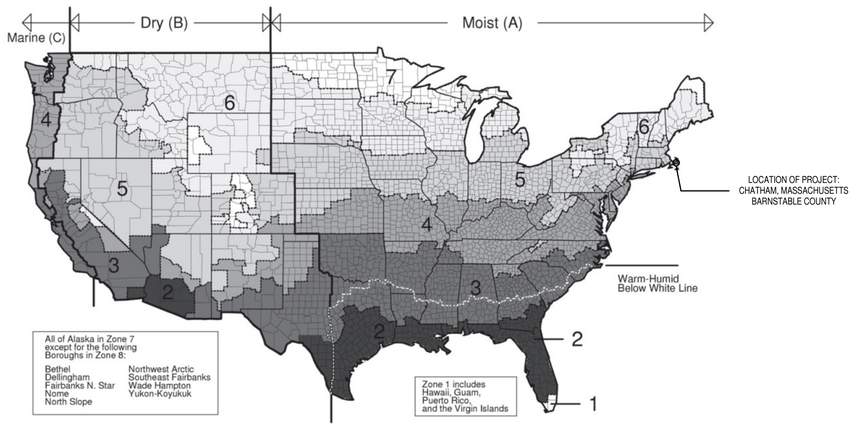


FIGURE C301.1CLIMATE ZONES

DEFERRED SUBMITTALS - IBC 107.3.4.1

SPECIFICATION NUMBER

DIVISION 21
21 13 13 – WET PIPE SPRINKLER SYSTEMS

ADDRESS IDENTIFICATION SIGNAGE:

TBD

APPLICABILITY:

- VERIFY SPECIFIC REQUIREMENTS WITH LOCAL FIRE CODE OFFICIAL
- CHARACTER HEIGHT - 4" MINIMUM W/ 1/2" STROKE MINIMUM
- COLOR - EASILY IDENTIFIABLE COLOR, CONTRASTING WITH BACKGROUND

2 EXTERIOR SIGNAGE - ADDRESS
1 1/2" = 1'-0" 3/ A201

INTERNATIONAL ENERGY CONSERVATION CODE 2018 (IECC) - ZONE 5

ENERGY CODE: WALL TYPE VALUES

TABLE C402.1.4 - IECC 2018

BRICK VENEER ON CMU BACK-UP WALL

MATERIAL	DEPTH	R-VALUE
BRICK VENEER	4.00"	0.69
CAVITY	1.75"	1.67
CONT. RIGID INSULATION	3.00"	15.41
VAPOR RETARDER	0.06"	0.12
CONC BACK-UP WALL	12.00"	2.56
TOTAL R-VALUE PROVIDED		20.45

COMPUTED U-VALUE: 1/R-VALUE = 1/20.45 = 0.049
REQUIRED U-VALUE = 0.080 FOR A MASS WALL

FIBER CEMENT SIDING ON CONTINUOUS RIGID INSULATION ON METAL STUD BACKUPWALL

MATERIAL	DEPTH	R-VALUE
FIBER CEMENT SIDING	0.25"	0.50
WEATHER BARRIER	0.06"	0.12
EXTERIOR SHEATHING	0.625"	0.56
CONT. RIGID INSULATION	1.75"	7.50
		8.68
VAPOR RETARDER	0.06"	0.12
MTL STUD W/ FIBERGLASS INSULATION	6.00"	20.00
TOTAL R-VALUE PROVIDED:		20.12 (R13 MIN REQ'D)
CONTINUOUS INSULATION:		+ 8.68 (R7.5ci MIN REQ'D)
COMPUTED U-VALUE: 1/R-VALUE = 1/28.80 = 0.0347		28.80
REQUIRED R-VALUE: R13 + R7.5ci		
REQUIRED U-VALUE = 0.064 FOR A METAL FRAMED WALL EQUIVALENT COMPUTED R-VALUE		15.62

ENERGY CODE: ROOF TYPE VALUES

TABLE C402.1.4 - IECC 2018

ASPHALT SHINGLE ROOF ASSEMBLY -NEW WITH STEEL DECK

MATERIAL	DEPTH	R-VALUE
ASPHALT SHINGLES	.100"	0.44
UNDERLAYMENT	N/A	0.06
AIR SPACE	1 1/2"	1.51
RIGID INSULATION - 5" MINIMUM (R-30 MIN ci)	5"	30.00
VAPOR RETARDER	N/A	0.06
SHEATHING	1/2"	.11
INSIDE AIR VALUE	N/A	0.61
TOTAL R-VALUE		R-32.79

COMPUTED U-VALUE: 1/R-VALUE = 1/32.79 = 0.0304
REQUIRED U-VALUE = 0.032 (R30ci)
FOR INSULATION ENTIRELY ABOVE ROOF DECK

ENERGY CODE: FENESTRATION VALUES

TABLE C402.4 - IECC 2018

BUILDING ENVELOPE FENESTRATIONS - U-FACTORS

MATERIAL	SPECIFIED U-VALUE	MAX ALLOWED U-VALUE
FIXED FENESTRATION	0.27 SUMMER / 0.30 WINTER	0.38
ENTRANCE DOORS (PERSONNEL)	0.33	0.77

SOLAR HEAT GAIN COEFFICIENT (SHGC)	SHGC SPECIFIED	SOUTH, EAST, WEST	NORTH
ORIENTATION			
PROJECTION FACTOR - PF < 0.2	0.37	0.40	0.53
PROJECTION FACTOR - 0.2 < PF < 0.5	0.37	0.48	0.58
PROJECTION FACTOR - PF ≥ 0.5	0.37	0.64	0.64

CODE SUMMARY

THE PROPOSED PROJECT IS A WATER TREATMENT PLANT IN CHATHAM, MASSACHUSETTS.

THE BUILDING IS LOAD BEARING CMU WALL WITH A BRICK VENEER THAT SUPPORTS TRUSSES AND ASPHALT SHINGLE ROOFING.

GENERAL BUILDING INFORMATION:
ALL AREAS ARE SHOWN IN GROSS SQUARE FEET (GSF).

BUILDING FOOTPRINT AREA: **2,723 GSF**

BUILDING HEIGHT (TO ROOF RIDGE): **26'-6"**

APPLICABLE CODES AND STANDARDS:

- MASSACHUSETTS STATE BUILDING CODE & APPROPRIATE AMENDMENTS:
  - 780 CMR NINTH EDITION
  - IBC 2015
- 2015 INTERNATIONAL MECHANICAL CODE (IMC)
- 248 CMR 10.00 UNIFORM STATE PLUMBING CODE (USPC)
- 2020 NATIONAL ELECTRICAL CODE
- 2018 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
  - 2017 STRETCH ENERGY CODE PROVISIONS ARE NOT APPLICABLE TO COMMERCIAL BUILDINGS LESS THAN 100,000 SF)
- 2019 MASSACHUSETTS COMPREHENSIVE FIRE CODE
  - 527 CMR, BOARD OF FIRE PREVENTION REGULATIONS
  - NFPA 1 FIRE CODE, 2015 EDITION
- 271 CMR: BOARD OF EXAMINERS OF SHEET METAL WORKERS

BUILDING CODE ANALYSIS:

CHAPTER 3 - USE AND OCCUPANCY CLASSIFICATION

306.3 FACTORY INDUSTRIAL GROUP F, F-2 (LOW-HAZARD)

- FACTORY INDUSTRIAL USES THAT INVOLVE THE FABRICATION OR MANUFACTURING OF NON-COMBUSTIBLE MATERIALS WHICH DURING FINISHING, PACKING OR PROCESSING DO NOT INVOLVE A SIGNIFICANT FIRE HAZARD, SHALL BE CLASSIFIED AS F-2 OCCUPANCIES.

CHAPTER 5- GENERAL BUILDING HEIGHTS AND AREAS

(TABLE. 504.3) ALLOWABLE BUILDING HEIGHT
TYPE VB CONSTRUCTION
"F" / S
ALLOWABLE HEIGHT: **60'-0"**
PROPOSED HEIGHT (COMPLIANT): **26'-6"**

(TABLE 504.4) ALLOWABLE NUMBER OF STORIES
"F-2" OCCUPANCY
ALLOWABLE STORIES: **3 STORIES**
PROPOSED STORIES (COMPLIANT): **1 STORY**

(TABLE 506.2) ALLOWABLE AREA FACTOR
"F-2" OCCUPANCY / SPRINKLERED (S1, BUILDINGS ONE STORY) **52,000 SF**
(TYPE VB CONSTRUCTION)
PROPOSED AREA FOR TOTAL BUILDING (COMPLIANT): **2,723 SF**

CHAPTER 6 - TYPES OF CONSTRUCTION

(TABLE 601) FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS

CONSTRUCTION TYPE VB - BUILDING ELEMENTS

STRUCTURAL FRAME (INC. COLUMNS, GIRDERS AND TRUSSES):	0 HRS
BEARING WALLS - EXTERIOR:	0 HRS
BEARING WALLS - INTERIOR:	0 HRS
NON BEARING WALLS AND PARTITIONS - EXTERIOR:	0 HRS
NON BEARING WALLS AND PARTITIONS - INTERIOR:	0 HRS
FLOOR CONSTRUCTION:	0 HRS
ROOF CONSTRUCTION:	0 HRS

(TABLE 602) FIRE RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE

CONSTRUCTION TYPE VB / F-2 OCCUPANCY
FIRE SEPARATION DISTANCE = CLOSET BUILDING IS > 30' AWAY THEREFORE RATING REQUIREMENTS ARE 0 HRS FOR EXTERIOR WALL ASSEMBLIES.

CHAPTER 9 - FIRE PROTECTION SYSTEMS

THERE ARE NO ADDITIONAL REQUIREMENTS FOR A GROUP F-2 FACTORY CLASSIFICATION.

CHAPTER 10 - MEANS OF EGRESS

(TABLE 1004.1.2) MAXIMUM FLOOR AREA ALLOWANCE PER OCCUPANT

INDUSTRIAL AREA = 100 GSF / OCC

(SECT. 1004) OCCUPANT LOAD

F-2, INDUSTRIAL AREA : 2,723 SF (÷ 100 SF/OCC) = 27 OCCUPANTS

(SECT. 1005) MEANS OF EGRESS SIZING

DOORWAY WIDTH REQUIRED MIN. 27 OCC @ 0.2 IN. PER OCC = 5.4 IN
DOORWAY WIDTH PROVIDED 36" (x 2 DOORS) = 64 IN CLEAR
- TWO SEPERATE DOOR WAYS PROVIDED FOR TWO SEPERATE ROOMS

(TABLE 1006.2.1) SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY
F OCCUPANCY MAXIMUM OCCUPANCY = 49
MAXIMUM PROVIDED = 27

SINCE THERE IS ONLY ONE EXIT, THERE IS NO COMMON PATH OF EGRESS TRAVEL DISTANCE, SEE BELOW FOR OVERALL EXIT ACCESS TRAVEL DISTANCE

(SECT. 1017) EXIT ACCESS TRAVEL DISTANCE
EXITS SHALL BE SO LOCATED ON EACH STORY THAT THE MAXIMUM LENGTH OF EXIT ACCESS TRAVEL, MEASURED FROM THE MOST REMOTE POINT WITHIN A STORY ALONG THE NATURAL AND UNOBSTRUCTED PATH OF EGRESS TRAVEL TO THE EXTERIOR EXIT DOOR AT THE LEVEL OF EXIT DISCHARGE SHALL NOT EXCEED THE DISTANCE GIVEN IN TABLE 1017.2:

(TABLE 1017.2) EXIT ACCESS TRAVEL DISTANCE (WITH SPRINKLER SYSTEM)

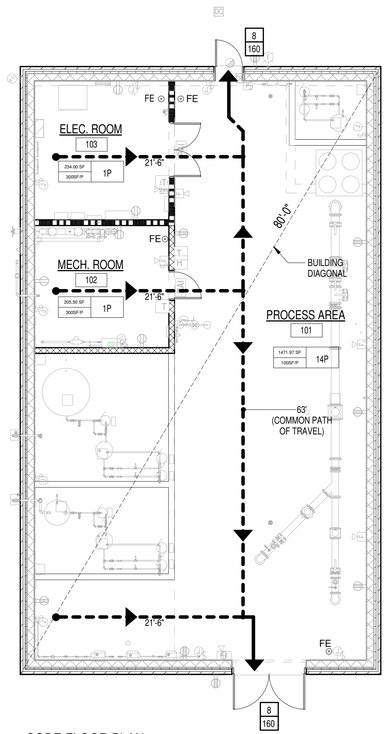
USE GROUP F-2 ALLOWABLE (MOST RESTRICTIVE): = 400 FT MAX
MAXIMUM PROVIDED: = 65 FT

CHAPTER 13 - ENERGY EFFICIENCY

THE BUILDING WILL COMPLY WITH CHAPTER 13 WHICH REFERENCES THE 2018 IECC. SEE TO THE LEFT FOR ADDITIONAL INFORMATION REGARDING R AND U-VALUES OF THE VARIOUS BUILDING COMPONENTS.

OTHER:
- CONFIRM FINAL ADDRESS / NUMBERING WITH FIRE DEPARTMENT.

- COORDINATE FINAL KEY REPOSITORY BOX LOCATION AND MOUNTING HEIGHT WITH THE FIRE DEPARTMENT



4 CODE FLOOR PLAN
1/8" = 1'-0" 1/ A201

CODE PLAN LEGEND

EXIT CAPACITY
###
###
ACTUAL EGRESS OF DOOR OR STAIR
MAXIMUM ALLOWABLE EGRESS CAPACITY OF DOOR OR STAIR

ROOM NAME
101
ROOM NUMBER

100
3000F/P
3P
MAXIMUM NUMBER OF ALLOWABLE OCCUPANTS
AREA IN NET SQUARE FEET (GROSS SQUARE FEET)
OCCUPANCY LOAD FACTOR

115'
PATH OF MAXIMUM TRAVEL DISTANCE TO EXIT

15
DIRECTION OF TRAVEL TO EXIT

FIRE EXTINGUISHER'S:

FE
FE = FIRE EXTINGUISHER, BRACKET MOUNTED

0' 4' 8' 16'
SCALE: 1/8" = 1'-0"

Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD CHATHAM, MA 02633

WELLS 10 AND 11 PUMPING AND TREATMENT DESIGN
MILL HILL ROAD CHATHAM, MA 02633

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Consultants:

Revisions:

No.	Date	Description

COA:

Seal:
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CAMBRIDGE
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COMMONWEALTH OF MASSACHUSETTS

Issued For:
BID

Scale: As indicated

Key Plan:
NORTH

Date:	MARCH 30, 2022
Drawn By:	AF
Reviewed By:	BMc
Approved By:	DGT
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
CODE SUMMARY

Sheet Number:
G101

3/29/2022 9:30:28 AM C:\Users\mcouskerb\OneDrive - WESTON & SAMPSON ENGINEERS, Inc\Documents\Chatham Wells 10 & 11 - Arch Model V20 - seperate_mcouskerb@westoninc.com.rvt

GENERAL NOTES

1. EXISTING CONDITIONS INFORMATION GENERATED FROM AN ON THE GROUND SURVEY PERFORMED BY WESTON & SAMPSON ENGINEERS, INC. (WSE) IN NOVEMBER OF 2021. WETLANDS WERE DELINEATED BY WSE ON OCTOBER 13, 2021.
2. BEARINGS ARE BASED UPON PLANS ENTITLED "SUBDIVISION PLAN, CHATHAM (NORTH WEST), MASSACHUSETTS", DATED JUNE 5, 2000 AND PREPARED BY ELDRIDGE QUIGLEY & CLARK. RECORDED IN THE BARNSTABLE COUNTY REGISTRY OF DEEDS BK 561 PG 33.
3. ELEVATIONS SHOWN ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), PER GPS OBSERVATIONS.
4. ALL BIDDERS ARE REQUIRED TO INSPECT THE PROJECT SITE IN ITS ENTIRETY PRIOR TO SUBMITTING THEIR BID, AND BECOME FAMILIAR WITH ALL CONDITIONS AS THEY MAY AFFECT THEIR BID. CONTRACTOR AND SUB-CONTRACTOR SHALL BE FAMILIAR WITH ALL DRAWINGS AND SPECIFICATIONS PRIOR TO COMMENCING THE CONSTRUCTION.
5. LOCATIONS OF ANY UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF SUCH UTILITIES, PROTECTING ALL EXISTING UTILITIES AND REPAIRING ANY DAMAGE DONE DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE COORDINATION WITH UTILITY COMPANIES AND PUBLIC AGENCIES AND FOR OBTAINING ALL REQUIRED PERMITS AND PAYING ALL REQUIRED FEES. IN ACCORDANCE WITH M.G.L. CHAPTER 82, SECTION 40, INCLUDING AMENDMENTS, CONTRACTORS SHALL NOTIFY ALL UTILITY COMPANIES AND GOVERNMENT AGENCIES IN WRITING PRIOR TO EXCAVATION.
6. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
7. THE CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY OWNER AT NO ADDITIONAL COST TO THE OWNER.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING ALL DRAWINGS AND SPECIFICATIONS TO DETERMINE THE EXTENT OF EXCAVATION AND DEMOLITION REQUIRED TO RECEIVE SITE IMPROVEMENTS.
9. ANY DISCREPANCIES OR CONFLICTS BETWEEN THE DRAWINGS AND EXISTING CONDITIONS, EXISTING CONDITIONS TO REMAIN, TEMPORARY CONSTRUCTION, PERMANENT CONSTRUCTION AND WORK OF ADJACENT CONTRACTS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER BEFORE PROCEEDING. ITEMS ENCOUNTERED IN AREAS OF EXCAVATION THAT ARE NOT INDICATED ON THE DRAWINGS, BUT ARE VISIBLE ON SURFACE, SHALL BE THE CONTRACTOR'S RESPONSIBILITY AND SHALL BE REMOVED AT NO ADDITIONAL COST TO THE OWNER.
10. ANY ALTERATIONS TO THESE DRAWINGS MADE IN THE FIELD DURING CONSTRUCTION SHALL BE RECORDED BY THE GENERAL CONTRACTOR ON "AS-BUILT" DRAWINGS.
11. ALL AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS OUTSIDE THE PROJECT LIMITS, SHALL BE RESTORED TO THE ORIGINAL CONDITION BY THE CONTRACTOR AT NO ADDITIONAL COST AND TO THE SATISFACTION OF THE OWNER.
12. ALL WORK SHOWN ON THE PLANS AS BOLD SHALL REPRESENT PROPOSED WORK. THE TERM "PROPOSED (PROP)" INDICATES WORK TO BE CONSTRUCTED USING NEW MATERIALS OR, WHERE APPLICABLE, RE-USING EXISTING MATERIALS IDENTIFIED AS "REMOVE AND RESET (R&R)", OR REMOVE, RELOCATE, RESET, (R,R&R).
13. ALL KNOWN EXISTING STATE, COUNTY AND CITY LOCATION LINES AND PRIVATE PROPERTY LINES HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND ARE INDICATED ON THE PLANS.
14. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT HIS EMPLOYEES, AS WELL AS PUBLIC USERS FROM INJURY DURING THE ENTIRE CONSTRUCTION PERIOD USING ALL NECESSARY SAFEGUARDS, INCLUDING BUT NOT LIMITED TO, THE ERECTION OF TEMPORARY WALKS, STRUCTURES, PROTECTIVE BARRIERS, COVERING, OR FENCES AS NEEDED.
15. THE CONTRACTOR SHALL SUPPLY THE OWNER WITH THE NAME OF THE OSHA "COMPETENT PERSON" PRIOR TO CONSTRUCTION.
16. FILLING OF EXCAVATED AREAS SHALL NOT TAKE PLACE WITHOUT THE PRESENCE OR PERMISSION OF THE OWNER.
17. EXISTING TREES TO REMAIN SHALL BE PROTECTED FROM CONSTRUCTION ACTIVITIES. NO STOCKPILING OF MATERIAL, EQUIPMENT OR VEHICULAR TRAFFIC SHALL BE ALLOWED WITHIN THE DRIP LINE OF TREES TO REMAIN. NO GUYS SHALL BE ATTACHED TO ANY TREE TO REMAIN. WHEN NECESSARY OR AS DIRECTED BY THE ENGINEER, THE CONTRACTOR SHALL ERECT TEMPORARY BARRIERS FOR THE PROTECTION OF EXISTING TREES DURING CONSTRUCTION.
18. THE CONTRACTOR SHALL CALL DIGSAFE AT 811 AT LEAST 72 HOURS, SATURDAYS, AND HOLIDAYS EXCLUDED, PRIOR TO EXCAVATING AT ANY LOCATION. A COPY OF THE DIGSAFE PROJECT REFERENCE NUMBER(S) SHALL BE GIVEN TO THE OWNER PRIOR TO EXCAVATION.
19. ALL FILL BELOW THE PROPOSED BUILDINGS SHALL CONFORM TO STRUCTURAL FILL IN ACCORDANCE WITH RECOMMENDATIONS PROVIDED BY A GEOTECHNICAL ENGINEER.
20. CONTRACTOR IS RESPONSIBLE FOR STAKING CONSTRUCTION BASELINES, BLDG, STRUCTURES, ETC WITH A LICENSED SURVEYOR IN FIELD. NO CONSTRUCTION WILL BE PERFORMED WITHOUT THE PROPOSED BASELINES AND LAYOUTS APPROVED BY THE ENGINEER.
21. NO FILL SHALL CONTAIN HAZARDOUS MATERIALS.
22. CONTRACTOR SHALL PROVIDE TEMPORARY FENCING AROUND PERIMETER OF WORK AREA (LIMIT OF WORK). FENCE SHALL NOT IMPEDE TRAVEL WAYS.
23. ANY QUANTITIES SHOWN ON PLANS ARE FOR COMPARATIVE BIDDING PURPOSES ONLY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VISIT THE PROJECT SITE TO VERIFY ALL QUANTITIES AND CONDITIONS PRIOR TO SUBMITTING BID.
24. CONTRACTOR'S STAGING AREA MUST BE WITHIN THE CONTRACT LIMIT LINE (LIMIT OF WORK AS IDENTIFIED ON THE PLANS).
25. CONTRACTOR SHALL COORDINATE ALL WORK WITH THE OWNER.
26. THE LIMIT OF WORK SHALL BE DELINEATED IN THE FIELD PRIOR TO THE START OF SITE CLEARING OR CONSTRUCTION.
27. HAULING OF EARTH MATERIALS TO AND FROM THE SITE SHALL BE RESTRICTED TO THE HOURS OF 7:00 AM TO 5:00 PM MONDAY THROUGH FRIDAY. HAULING SHALL ALSO BE PROHIBITED ON STATE AND FEDERAL HOLIDAYS.
28. ANY BOULDERS 3 CY OR SMALLER SHALL BE CONSIDERED UNDOCUMENTED FILL AND SHALL BE DISPOSED OF AT NO ADDITIONAL COST TO THE OWNER.

EROSION AND SEDIMENT CONTROL NOTES

1. ALL SEDIMENT AND EROSION CONTROL DEVICES SHALL BE PUT INTO PLACE BY G.C. PRIOR TO BEGINNING ANY CONSTRUCTION OR DEMOLITION. REFER TO PLAN FOR APPROXIMATE LOCATION OF EROSION AND SEDIMENT CONTROL. REFER TO SPECS AND DETAILS FOR TYPE OF EROSION AND SEDIMENT CONTROL.
2. THE G.C. SHALL BE RESPONSIBLE FOR THE CONTINUAL MAINTENANCE OF ALL CONTROL DEVICES THROUGHOUT THE DURATION OF THE PROJECT.
3. CONTRACTOR SHALL MEET ALL OF THE STATE OF MASSACHUSETTS D.E.P. WETLAND ORDINANCE REGULATIONS FOR SEDIMENT AND EROSION CONTROL.
4. EXCAVATED MATERIAL STOCKPILED ON THE SITE SHALL BE SURROUNDED BY A RING OF UNBROKEN SEDIMENT AND EROSION CONTROL FENCE. THE LIMITS OF ALL GRADING AND DISTURBANCE SHALL BE KEPT TO A MINIMUM WITHIN THE APPROVED AREA OF CONSTRUCTION. ALL AREAS OUTSIDE OF THE LIMIT OF CONTRACT SHALL REMAIN TOTALLY UNDISTURBED UNLESS OTHERWISE APPROVED BY OWNER'S REPRESENTATIVE.
5. ALL CATCH BASINS AND DRAIN GRATES WITHIN LIMIT OF CONTRACT SHALL BE PROTECTED WITH FILTER FABRIC DURING THE ENTIRE DURATION OF CONSTRUCTION.
6. EROSION CONTROL BARRIERS TO BE INSTALLED AS SHOWN ON PLANS.
7. ANY AREA OUTSIDE THE PROJECT LIMIT THAT IS DISTURBED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO COST TO THE OWNER.
8. THE CONTRACTOR SHALL PROVIDE DUST CONTROL FOR CONSTRUCTION OPERATIONS AS APPROVED BY OWNER.
9. ALL POINTS OF CONSTRUCTION EGRESS OR INGRESS SHALL BE MAINTAINED TO PREVENT TRACKING OR FLOWING OF SEDIMENT ON TO PUBLIC/PRIVATE ROADS.

DEMOLITION & SITE PREPARATION NOTES

1. THE CONTRACTOR SHALL INCLUDE IN THE BID THE COST OF REMOVING ANY EXISTING SITE FEATURES AND APPURTENANCES NECESSARY TO ACCOMPLISH THE CONSTRUCTION OF THE PROPOSED SITE IMPROVEMENTS. THE CONTRACTOR SHALL ALSO INCLUDE IN THE BID THE COST NECESSARY TO RESTORE SUCH ITEMS IF THEY ARE SCHEDULED TO REMAIN AS PART OF THE FINAL SITE IMPROVEMENTS. REFER TO PLANS TO DETERMINE EXCAVATION, DEMOLITION AND TO DETERMINE THE LOCATION OF THE PROPOSED SITE IMPROVEMENTS.
2. THE OWNER RESERVES THE RIGHT TO REVIEW ALL MATERIALS DESIGNATED FOR REMOVAL AND TO RETAIN OWNERSHIP OF SUCH MATERIALS. IF THE OWNER RETAINS ANY MATERIAL THE CONTRACTOR SHALL ALLOW ARRANGEMENTS WITH THE OWNER TO HAVE THOSE MATERIALS REMOVED OFF SITE AT NO ADDITIONAL COST.
3. DURING EARTHWORK OPERATIONS, CONTRACTOR SHALL TAKE CARE TO NOT DISTURB EXISTING MATERIALS TO REMAIN, OUTSIDE THE LIMITS OF EXCAVATION AND BACKFILL AND SHALL TAKE WHATEVER MEASURES NECESSARY, AT THE CONTRACTOR'S EXPENSE, TO PREVENT ANY EXCAVATED MATERIAL FROM COLLAPSING. ALL BACKFILL MATERIALS SHALL BE PLACED AND COMPACTED AS SPECIFIED TO THE SUBGRADE REQUIRED FOR THE INSTALLATION OF THE REMAINDER OF THE CONTRACT WORK.
4. IT SHALL BE THE CONTRACTOR'S OPTION, WITH CONCURRENCE OF THE OWNER, TO REUSE EXISTING GRAVEL IF IT MEETS THE REQUIREMENTS OF THE SPECIFICATIONS FOR GRAVEL BORROW.
5. THE STORAGE OF MATERIALS AND EQUIPMENT WILL BE PERMITTED AT LOCATIONS DESIGNATED BY OWNER OR OWNER'S REPRESENTATIVE. PROTECTION OF STORED MATERIALS AND EQUIPMENT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

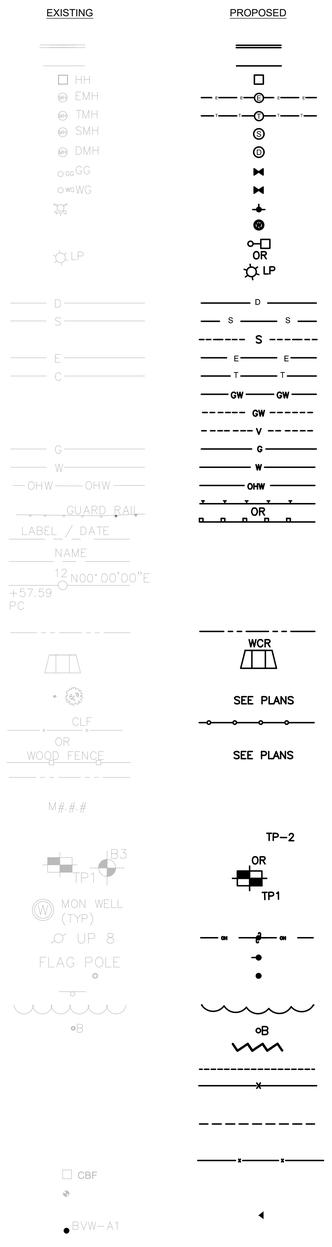
LAYOUT & MATERIALS NOTES

1. COORDINATE ALL LAYOUT ACTIVITIES WITH THE SCOPE OF WORK CALLED FOR BY DEMOLITION, GRADING AND UTILITIES OPERATIONS ENCOMPASSED BY THIS CONTRACT. SET, PROTECT AND REPLACE REFERENCE STAKES AS NECESSARY OR AS REQUIRED BY THE OWNER'S REPRESENTATIVE.
2. ALL WORK SHALL BE PERFORMED BY CONTRACTOR UNLESS SPECIFICALLY INDICATED THAT THE WORK WILL BE PERFORMED "BY OTHERS".
3. THE LAYOUT OF SITE AMENITIES AND FENCES MUST BE APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
4. THE LAYOUT OF ALL NEW PATHWAYS / WALKWAYS AND THE GRADING OF ALL SLOPES AND CROSS SLOPES SHALL CONFORM TO THE COMMONWEALTH OF MASSACHUSETTS RULES AND REGULATIONS FOR HANDICAP ACCESS CMR 521, AND THE AMERICANS WITH DISABILITIES ACT (ADA), TITLE 3. THE CONTRACTOR SHALL NOTIFY THE OWNER IMMEDIATELY OF ANY DISCREPANCIES BETWEEN ACTUAL CONDITIONS AND THOSE REQUIRED.
5. ALL LAYOUT LINES, OFFSETS, OR REFERENCES TO LOCATING OBJECTS ARE EITHER PARALLEL OR PERPENDICULAR UNLESS OTHERWISE DESIGNATED WITH ANGLE OFFSETS NOTED.
6. ALL PROPOSED SITE FEATURES SHALL BE LAID OUT AND STAKED FOR REVIEW AND APPROVAL BY THE OWNER'S REPRESENTATIVE PRIOR TO COMMENCEMENT OF INSTALLATION. ANY REQUIRED ADJUSTMENTS TO THE LAYOUT SHALL BE UNDERTAKEN AS REQUIRED, AT NO ADDITIONAL COST TO THE OWNER.
7. ALL PROPOSED PAVEMENTS SHALL MEET THE LINE AND GRADE OF EXISTING ADJACENT PAVEMENT SURFACES AND SHALL BE TREATED WITH AN RS-1 TACK COAT AT POINT OF CONNECTION. ALL PATHWAY WIDTHS SHALL BE AS NOTED ON THE LAYOUT AND MATERIALS PLAN.
8. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND GRADES ON THE GROUND AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE OWNER.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD MEASUREMENT OF ALL PROPOSED FENCES AND GATES.
10. ALL REFERENCES TO LOAM AND SEED (L&S) REFER TO HYDROMULCH SEEDED LAWN, UNLESS NOTED OTHERWISE.
11. CONTRACTOR SHALL PERFORM ALL EARTHWORK IN CONFORMANCE WITH PROJECT GEOTECHNICAL RECOMMENDATIONS AND SPECIFICATIONS.
12. EXCESS FILL MATERIAL SHALL BE REMOVED & DISPOSED OF BY THE CONTRACTOR AT NO ADDITIONAL COST.

GRADING, UTILITIES & DRAINAGE NOTES

1. THE CONTRACTOR SHALL OBTAIN PERMISSION FROM THE THE TOWN OF CHATHAM DPW PRIOR TO PERFORMING ANY EXCAVATION WITHIN MILL HILL ROAD.
2. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND GRADES ON THE GROUND AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE OWNER.
3. ALL GRADING IS TO BE SMOOTH AND CONTINUOUS WHERE PROPOSED SURFACE MEETS EXISTING SURFACE, BLEND THE TWO PAVEMENTS AND ELIMINATE ROUGH SPOTS AND ABRUPT GRADE CHANGES AND MEET LINE AND GRADE OF EXISTING CONDITIONS WITH NEW IMPROVEMENTS.
4. CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE (2.0% MINIMUM) AWAY FROM ALL BUILDING FOUNDATIONS AND STRUCTURES.
5. CONTRACTOR SHALL ENSURE ALL AREAS ARE PROPERLY PITCHED TO DRAIN, WITH NO SURFACE WATER PONDING OR PUDDLING.
6. ALL NEW WALKWAYS / ACCESS PATHS MUST CONFORM TO CURRENT AMERICANS WITH DISABILITIES ACT (ADA) REGULATIONS: WALKWAYS SHALL MAINTAIN A CROSS PITCH OF NOT MORE THAN TWO PERCENT (2%) AND THE RUNNING SLOPE (PARALLEL TO THE DIRECTION OF TRAVEL) BETWEEN 1% MIN. AND 5% MAX.
7. MINIMUM SLOPE ON ALL WALKWAYS WILL BE 1:100 OR 1% TO PROVIDE POSITIVE DRAINAGE. ANY DISCREPANCIES NOT ALLOWING THIS TO OCCUR SHALL BE REPORTED TO THE OWNER PRIOR TO CONTINUING WORK.
8. ALL UTILITY GRATES, COVERS OR OTHER SURFACE ELEMENTS INTENDED TO BE EXPOSED AT GRADE SHALL BE FLUSH WITH THE ADJACENT FINISHED GRADE AND ADJUSTED TO PROVIDE A SMOOTH TRANSITION AT ALL EDGES.
9. THE CONTRACTOR SHALL SET SUBGRADE ELEVATIONS TO ALLOW FOR POSITIVE DRAINAGE AND PROVIDE EROSION CONTROL DEVICES, STRUCTURES, MATERIALS AND CONSTRUCTION METHODS TO DIRECT SILT MIGRATION AWAY FROM DRAINAGE AND OTHER UTILITY SYSTEMS, PUBLIC/PRIVATE STREETS AND WORK AREAS. CLEAN BASINS REGULARLY AND AT THE END OF THE PROJECT.
10. EXCAVATION REQUIRED WITHIN PROXIMITY OF KNOWN EXISTING UTILITY LINES SHALL BE DONE BY HAND. CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING UTILITY LINES OR STRUCTURES INCURRED DURING CONSTRUCTION OPERATIONS AT NO COST TO THE OWNER.
11. WHERE NEW EARTHWORK MEETS EXISTING EARTHWORK, CONTRACTOR SHALL BLEND NEW EARTHWORK SMOOTHLY INTO EXISTING, PROVIDING VERTICAL CURVES OR ROUNDS AT ALL TOP AND BOTTOM OF SLOPES.
12. WHERE A SPECIFIC LIMIT OF WORK LINE IS NOT OBVIOUS OR IMPLIED, BLEND GRADES TO EXISTING CONDITIONS WITHIN 5 FEET OF PROPOSED CONTOURS.
13. RESTORE ALL DISTURBED AREAS AND LIMITS OF ALL REMOVALS TO LOAM AND SEED (L&S) UNLESS OTHERWISE NOTED.
14. ALL PRECAST STRUCTURES SHALL BE RATED FOR H-20 LOADING.

GENERAL SYMBOLS



CURB (OR BERM)-TYPE NOTED	
EDGE OF ROAD	
HANDHOLE (NUMBER AS NOTED)	
ELECTRIC MANHOLE	
TELEPHONE MANHOLE	
SEWER MANHOLE	
DRAINAGE MANHOLE	
GAS GATE	
WATER GATE VALVE	
HYDRANT	
WELL	
LIGHTPOLE	
DRAIN PIPE	
SEWER MAIN	
SEWER MAIN BY P.C.	
ELECTRIC DUCT	
TELEPHONE/COMMUNICATIONS/FIRE ALARM	
GARAGE WASTE LINE	
GARAGE WASTE LINE BY P.C.	
VENTS BY P.C.	
GAS MAIN	
WATER MAIN	
OVERHEAD WIRES	
GUARD RAIL (SIZE AND TYPE NOTED)	
HIGHWAY / PROPERTY BOUND (TYPE NOTED)	
CITY OR CITY OR COUNTY LAYOUT LINE	
CITY,CITY OR COUNTY BOUNDARY	
BASE OR SURVEY LINE	
CENTERLINE OF CONSTRUCTION	
PROPERTY LINE	
WHEELCHAIR RAMP (WCR)	
TREE (SIZE AND TYPE NOTED)	
FENCE (SIZE AND TYPE NOTED)	
EASEMENT LINE/ FUTURE CITY PROPERTY LINE	
MASSHIGHWAY STANDARD SPECIFICATION REFERENCE NUMBER	
TEST PIT/BORINGS	
MONITORING WELL	
UTILITY POLE	
GUY POLE	
FLAG POLE	
TREE LINE	
BOLLARD	
BIKE RACK	
SAWCUT	
EROSION CONTROL (SPECIFIED ON PLANS)	
OBSERVATION WELL	
LIMIT OF WORK	
TEMPORARY FENCE	
CONCRETE BOUND FOUND	
TEMPORARY BENCHMARK (TBM)	
DI WATER REDUCER	
WETLAND FLAG	

ABBREVIATIONS

GENERAL

PROP	PROPOSED
ADJ	ADJUST
BIT. CONC.	BITUMINOUS CONCRETE
CEM. CONC.	CEMENT CONCRETE
B	BASELINE
N.T.S.	NOT TO SCALE
B.M.	BENCH MARK
ABAN	ABANDON
MB	MAIL BOX
GRAN. CURB	GRANITE CURB
EXIST. (OR EX.)	EXISTING
FDN	FOUNDATION
F.L. (OR F)	FLOW LINE
P	PROPERTY LINE
PVMT	PAVEMENT
P.W.W.	PAVED WATERWAY
RC	REINFORCED CONCRETE
M.H.B.	MASSACHUSETTS HIGHWAY BOUND
REM	REMOVE
REMOD	REMODEL
RET	RETAIN
R.O.W.	RIGHT-OF-WAY
R&R	REMOVE AND RESET
R,R&R	REMOVE, RELOCATED AND RESET
R&S	REMOVE AND STACK
R&D	REMOVE AND DISPOSE
SB	STONE BOUND
NIC	NOT IN CONTRACT
H.C.	HANDICAP
WCR	WHEELCHAIR RAMP
FF	FINISHED FLOOR
HMA	HOT MIX ASPHALT
G.C.	GENERAL CONTRACTOR
E.C.	ELECTRICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
SWEL	SOLID WHITE EDGE LINE
BWLL	BROKEN WHITE LANE LINE
SYEL	SOLID YELLOW EDGE LINE
SB/DH	STONE BOUND/ DRILL HOLE
CLF	CHAIN LINK FENCE
TEMP.	TEMPORARY
TYP.	TYPICAL
EQ	EQUIPMENT
H.C.	HANDICAP
EOP	EDGE OF PAVEMENT
PROT	PROTECT
CTE	CONNECT TO EXISTING
RL	ROOF LEADER
L.O.W.	LIMIT OF WORK
VIF	VERIFY IN FIELD
APPROX.	APPROXIMATE
TBM	TEMPORARY BENCHMARK
ALT.	ALTERNATE
BVW	BORDERING VEGETATED WETLAND

UTILITIES

GICI	GUTTER INLET W/ CURB INLET
CBCI	CATCH BASIN W/ CURB INLET
CB	CATCH BASIN
C.I.T.	CHANGE IN TYPE
CTE	CONNECT TO EXISTING
F&G	FRAME AND GRATE
F&C	FRAME AND COVER
CI	CURB INLET
CIP	CAST IRON PIPE
CMP	CORRUGATED METAL PIPE
DI	DUCTILE IRON PIPE
GI	GUTTER INLET
ACCM PIPE	ASPHALT COATED CORRUGATED METAL PIPE
HYD	HYDRANT
INV. ELEV.	INVERT ELEVATION
UP	UTILITY POLE
SMH	SEWER MANHOLE
WG	WATER GATE
DS	DOWN SPOUT
HDPE	HIGH DENSITY POLYETHYLENE PIPE
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
DMH	DRAIN MANHOLE
LB	LEACHING BASIN
LG	LEACHING GALLEY
CI	CAST IRON
OCS	OUTLET CONTROL STRUCTURE
OGT	OIL AND GRIT TRAP
VC	VITRIFIED CLAY PIPE
LP	LIGHT POLE
OHW	OVERHEAD WIRE
UPLP	UTILITY POLE WITH LIGHT
SWTU	STORM WATER TREATMENT UNIT
HH	HANDHOLE
GW	GARAGE WASTE
CO	CLEANOUT
LC	LEACHING CHAMBER
GV	GATE VALVE

ALIGNMENT/GRADING

BW	BOTTOM OF WALL
BC	BOTTOM OF CURB
PI	POINT OF INTERSECTION
PC	POINT OF CURVATURE
PT	POINT OF TANGENCY
PRC	POINT OF REVERSE CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PVI	POINT OF VERTICAL INTERSECTION
PVC	POINT OF VERTICAL CURVATURE
PVT	POINT OF VERTICAL TANGENCY
ELEV	ELEVATION
CC	CENTER OF CURVE
H.P.	HIGH POINT
L.P.	LOW POINT
R	RADIUS OF CURVATURE
STA	STATION
S.S.D.	STOPPING SIGHT DISTANCE
TC	TOP OF CURB
TW	TOP OF WALL

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CHATHAM, MA 02633

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Seal:
COMMONWEALTH OF MASSACHUSETTS
JAMES I. PEARSON
CIVIL
No. 50675
REGISTERED PROFESSIONAL ENGINEER
03/30/2022

Issued For:
BID

Scale: AS SHOWN

Date:	MARCH 30, 2022
Drawn By:	AKG
Reviewed By:	JIP
Approved By:	LES
W&S Project No.:	ENG21-1001
W&S File No.:	

Drawing Title:
NOTES & LEGEND

Sheet Number:
C001

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Issued 3 June 2022 P:\Projects\MA\Chatham MA\Wtr & Ww\11 - Pumping and Treatment Design\CAD\Cad\01 Sheet\C001.dwg

MILL POND

TOB–B6

TOB–B5

TOB–B4

N/F
THE TOWN OF CHATHAM
BK. 14092 PG. 350
"LOT 2" (SEE MAP REF. A)
ZONING DISTRICT R60

N/F
THE TOWN OF CHATHAM
BK. 14092 PG. 350
"LOT 3" (SEE MAP REF. A)
ZONING DISTRICT R60

N/F
THE TOWN OF CHATHAM
BK. 14092 PG. 350
"LOT 1" (SEE MAP REF. A)

N/F
PAUL H. LAPHAM &
LINDA LAPHAM, TRUSTEES
77 DUSTY MILLER LANE
BK. 29107 PG. 138

N/F
DAVID G. & MARIAH M.
MCMANUS
37 DUSTY MILLER LANE
BK. 21122 PG. 93

N/F
THE TOWN OF CHATHAM
BK. 22230 PG. 213
ZONING DISTRICT R60

N/F
MARY NICKERSON
95 DUSTY MILLER LANE
BK. 3335 PG. 300
BK. 8250 PG. 126

MILL FARM LANE
(PRIVATE WAY - 40' WIDE)

PROP GRAVEL DRIVEWAY TO WELL 10

PROP 5-FT WIDE BIT CONC WALKWAY W/ 5-FT x 5-FT CONC LANDING AT BUILDING ENTRANCE

DECOMMISSION MONITORING WELL PER SPECIFICATIONS. CUT EX WELL CASING & CAP W/ DUCTILE IRON MJ CAP

PROP CHAIN LINK FENCE AROUND 20-FT x 20-FT WELL AREA W/ DOUBLE 8-FT WIDE SWING GATES (TYP)

PROP BIT CONC DRIVEWAY SECTION

PROP GRAVEL PAD FOR POTENTIAL FUTURE FILTRATION BUILDING (SEE NOTE 1)

PROP TREATMENT BUILDING

EXISTING FENCE TO BE REMOVED UP TO PROPERTY LINE

EXISTING BUILDING
F.F.=61.5'±

EROSION CONTROL (TYP)

PROP 4-FT x 8.5-FT CONC LANDING

PROP GRAVEL PARKING AREA (5 SPACES)

PROP BOLLARD (TYP)

PROP GRAVEL DRIVEWAY TO WELL 11

(2) PROP 2,000-GAL PROPANE TANKS & (2) 5-FTx25-FT CONC PADS

PROP 8-FTx8-FT CONC TRANSFORMER PAD

PROP 8-FTx20-FT CONC GENERATOR PAD

BENCHMARK "C"
MAG NAIL IN
24" PINE
ELEV=54.90'

MUNICIPAL CONSERVANCY DISTRICT

R60 DISTRICT

N/F
THE TOWN OF CHATHAM
BK. 6636 PG. 7
ZONING DISTRICT MC

N/F
THE TOWN OF CHATHAM
BK. 14092 PG. 350
"LOT 4" (SEE MAP REF. A)
ZONING DISTRICT R60

BENCHMARK "B"
MAG NAIL IN
24" OAK
ELEV=38.78'

100–FT POND SETBACK (TYP)

50–FT POND SETBACK (TYP)

LITTLE POND

TOB–A1

TOB–A2

TOB–A3

TOB–A4

EROSION CONTROL (TYP)

LIMIT OF WORK (TYP)

PROP GRAVEL DRIVEWAY

N/F
THE TOWN OF CHATHAM
BK. 22230 PG. 213
"LOT 5" (SEE MAP REF. A)
ZONING DISTRICT R60

GRAVEL SURFACE ON ALL DISTURBED AREAS WITHIN EX GRAVEL PARKING AREA

PROP 24-FT WIDE DOUBLE LEAF SWING ARM GATE

MAINTAIN ACCESS TO EX BIT CONC DRIVEWAY

PROP BIT CONC DRIVEWAY APRON

BENCHMARK "A"
MAG NAIL IN
UTILITY POLE
ELEV=41.81'

MILL HILL ROAD
(PUBLIC - 40' WIDE)

NOTES

1. THE PROPOSED FILTRATION BUILDING LOCATION SHALL BE PREPARED AND LEFT AS A GRAVEL PAD FOR POTENTIAL FUTURE DEVELOPMENT.
2. CONTRACTOR IS RESPONSIBLE FOR ALL CLEARING AND GRUBBING WITHIN THE LIMIT OF WORK.

40 20 0 40 80
SCALE: 1"=40'

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CHATHAM WATER & SEWER DIVISION
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03/30/2022

Issued For:
BID

Scale: AS SHOWN

Date: MARCH 30, 2022
Drawn By: AKG
Reviewed By: JIP
Approved By: LES

W&S Project No.: ENG21-1001
W&S File No.:

Drawing Title:
LAYOUT & MATERIALS PLAN

Sheet Number:
C101

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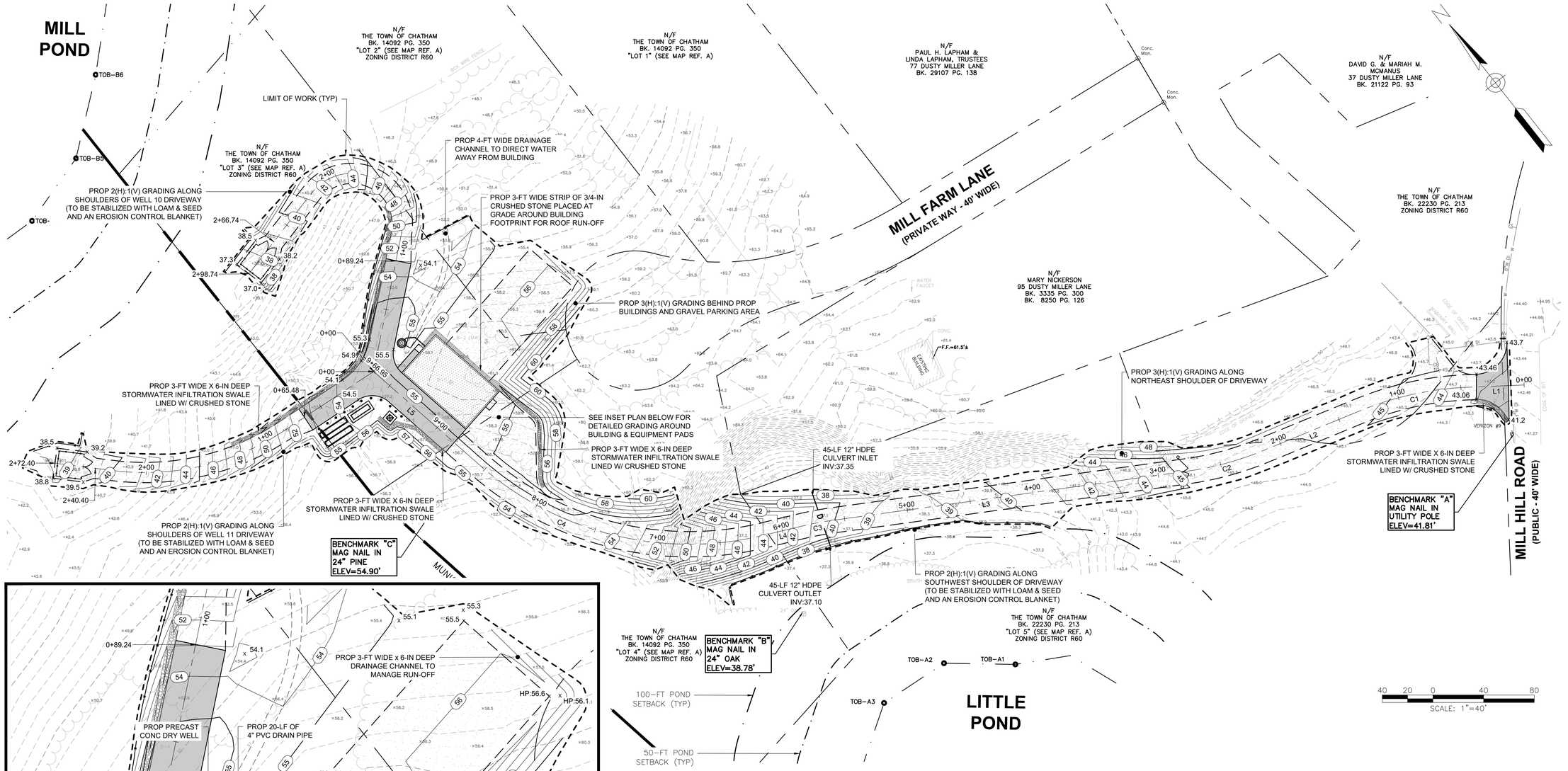
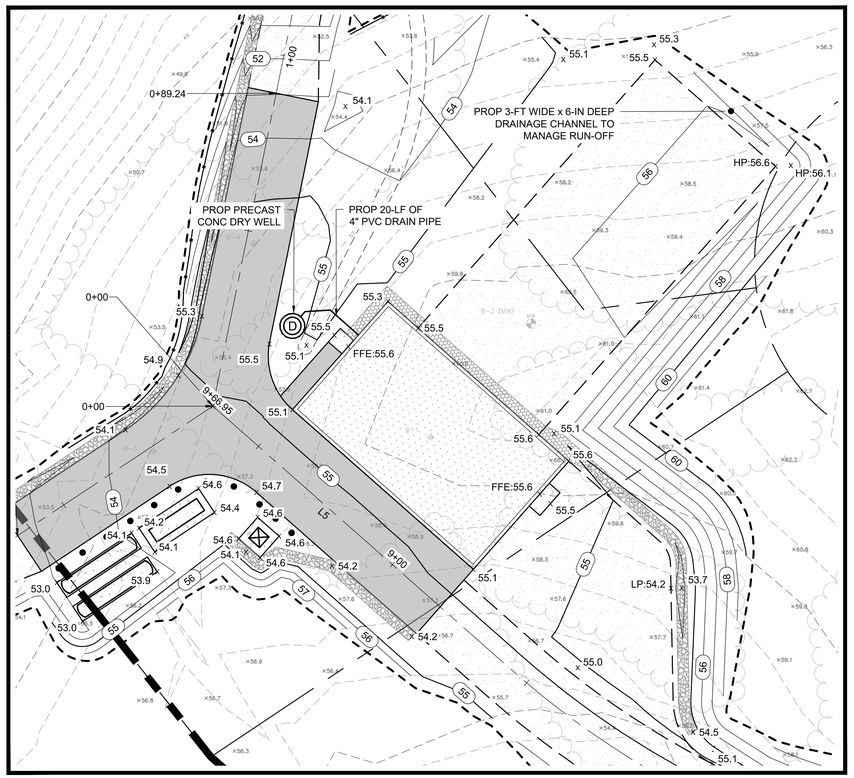
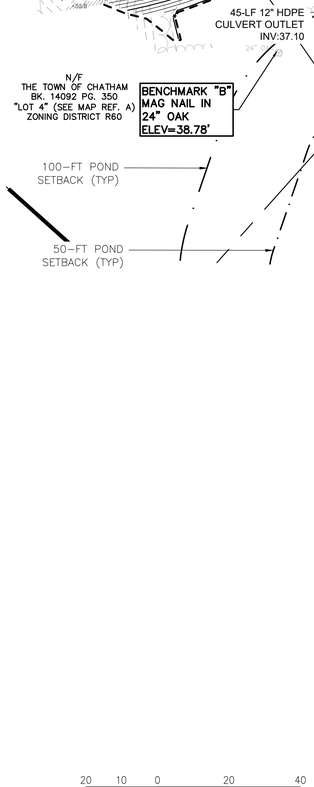

MILL POND
N/F THE TOWN OF CHATHAM BK. 14092 PG. 350 "LOT 2" (SEE MAP REF. A) ZONING DISTRICT R60
N/F THE TOWN OF CHATHAM BK. 14092 PG. 350 "LOT 1" (SEE MAP REF. A)
N/F PAUL H. LAPHAM & LINDA LAPHAM, TRUSTEES 77 DUSTY MILLER LANE BK. 29107 PG. 138
N/F DAVID G. & MARIAH M. MCMANUS 37 DUSTY MILLER LANE BK. 21122 PG. 93
N/F THE TOWN OF CHATHAM BK. 14092 PG. 350 "LOT 3" (SEE MAP REF. A) ZONING DISTRICT R60
LIMIT OF WORK (TYP)
PROP 4-FT WIDE DRAINAGE CHANNEL TO DIRECT WATER AWAY FROM BUILDING
PROP 3-FT WIDE STRIP OF 3/4-IN CRUSHED STONE PLACED AT GRADE AROUND BUILDING FOOTPRINT FOR ROOF RUN-OFF
PROP 2(H):1(V) GRADING ALONG SHOULDERS OF WELL 10 DRIVEWAY (TO BE STABILIZED WITH LOAM & SEED AND AN EROSION CONTROL BLANKET)
MILL FARM LANE (PRIVATE WAY - 40' WIDE)
N/F MARY NICKERSON 95 DUSTY MILLER LANE BK. 3335 PG. 300 BK. 8250 PG. 126
N/F THE TOWN OF CHATHAM BK. 22230 PG. 213 ZONING DISTRICT R60
PROP 3(H):1(V) GRADING BEHIND PROP BUILDINGS AND GRAVEL PARKING AREA
PROP 3(H):1(V) GRADING ALONG NORTHEAST SHOULDER OF DRIVEWAY
PROP 3-FT WIDE X 6-IN DEEP STORMWATER INFILTRATION SWALE LINED W/ CRUSHED STONE
SEE INSET PLAN BELOW FOR DETAILED GRADING AROUND BUILDING & EQUIPMENT PADS
45-LF 12" HDPE CULVERT INLET INV:37.35
BENCHMARK "A" MAG NAIL IN UTILITY POLE ELEV=41.81'
MILL HILL ROAD (PUBLIC - 40' WIDE)
BENCHMARK "C" MAG NAIL IN 24" PINE ELEV=54.90'
PROP 2(H):1(V) GRADING ALONG SHOULDERS OF WELL 11 DRIVEWAY (TO BE STABILIZED WITH LOAM & SEED AND AN EROSION CONTROL BLANKET)
45-LF 12" HDPE CULVERT OUTLET INV:37.10
PROP 2(H):1(V) GRADING ALONG SOUTHWEST SHOULDER OF DRIVEWAY (TO BE STABILIZED WITH LOAM & SEED AND AN EROSION CONTROL BLANKET)
N/F THE TOWN OF CHATHAM BK. 14092 PG. 350 "LOT 4" (SEE MAP REF. A) ZONING DISTRICT R60
BENCHMARK "B" MAG NAIL IN 24" OAK ELEV=38.78'
N/F THE TOWN OF CHATHAM BK. 22230 PG. 213 "LOT 5" (SEE MAP REF. A) ZONING DISTRICT R60
100-FT POND SETBACK (TYP)
50-FT POND SETBACK (TYP)
LITTLE POND
TOB-B6
TOB-B5
TOB-
TOB-A1
TOB-A2
TOB-A3
F.F.=61.5'±
VERIZON #9
SCALE: 1"=40'





MAIN ACCESS ROAD CONSTRUCTION BASELINE DATA

NUMBER	STARTING STATION	CURVE DATA	LINE DATA	ENDING STATION
L1	0+00.00		N54°58'38"W 44.44'	0+44.44
C1	0+44.44	R=250.00' Δ=20°04'55" L=87.62' T=44.27'		1+32.06
L2	1+32.06		N75°03'33"W 82.51'	2+14.57
C2	2+14.57	R=250.00' Δ=14°27'56" L=63.12' T=31.73'		2+77.68
L3	2+77.68		N60°35'37"W 282.84'	5+60.52
C3	5+60.52	R=250.00' Δ=5°47'49" L=25.29' T=12.66'		5+85.82
L4	5+85.82		N66°23'25"W 29.05'	6+14.86
C4	6+14.86	R=250.00' Δ=55°08'07" L=240.57' T=130.52'		8+55.44
L5	8+55.44		N11°15'18"W 111.52'	9+66.95

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Seal:
COMMONWEALTH OF MASSACHUSETTS
JAMES I. PEARSON
CIVIL
No. 50675
REGISTERED PROFESSIONAL ENGINEER
03/30/2022

Issued For:
BID

Scale: AS SHOWN

Date: MARCH 30, 2022
Drawn By: AKG
Reviewed By: JIP
Approved By: LES

W&S Project No.: ENG21-1001
W&S File No.:

Drawing Title:
GRADING & DRAINAGE PLAN

Sheet Number:
C102

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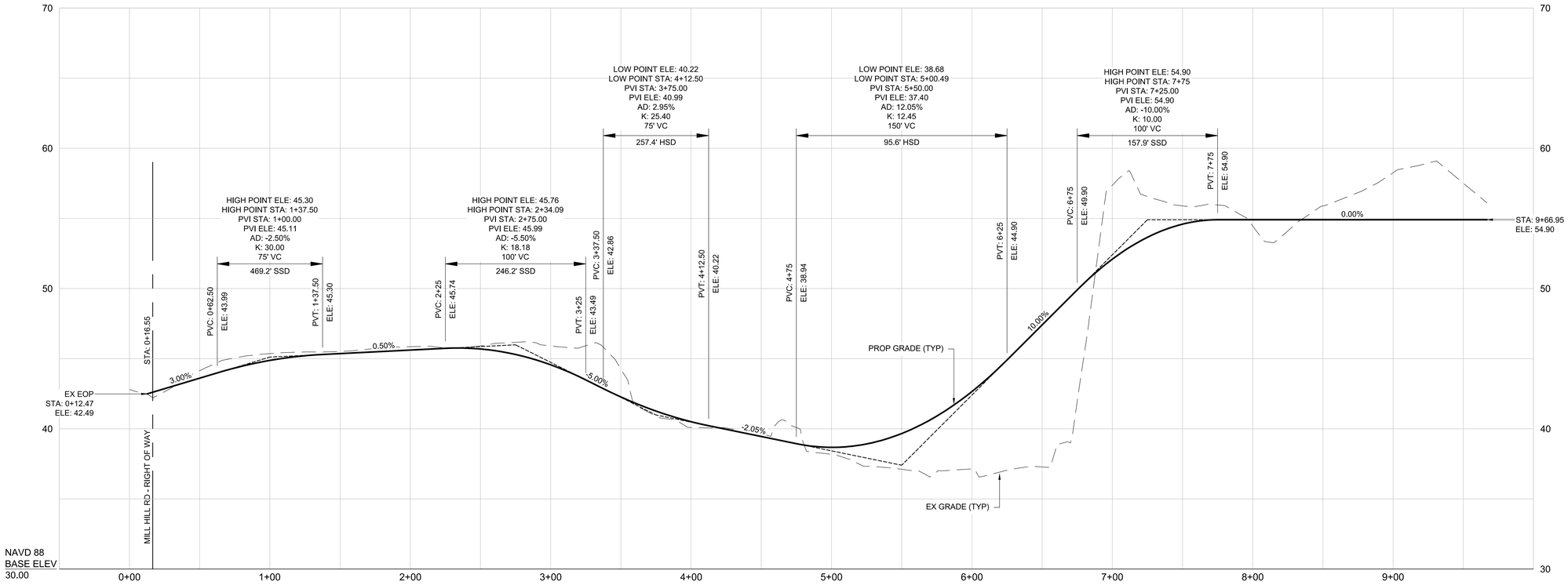
\\ws01\Data\WSP2\Projects\MA\Chatham MA\WM 10 and 11 - Pumping and Treatment Design\CAD\C\dgn\C102.dwg

MAIN ACCESS ROAD



HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=4'

Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD
CHATHAM, MA 02633

WELLS 10 & 11 PUMPING AND TREATMENT DESIGN
MILL HILL ROAD
CHATHAM, MA 02633

Weston & Sampson Engineers, Inc.
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Consultants:

Revisions:

No.	Date	Description

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W&S Project No.: ENG21-1001
W&S File No.:

Drawing Title:
DRIVEWAY PROFILES

Sheet Number:
C103

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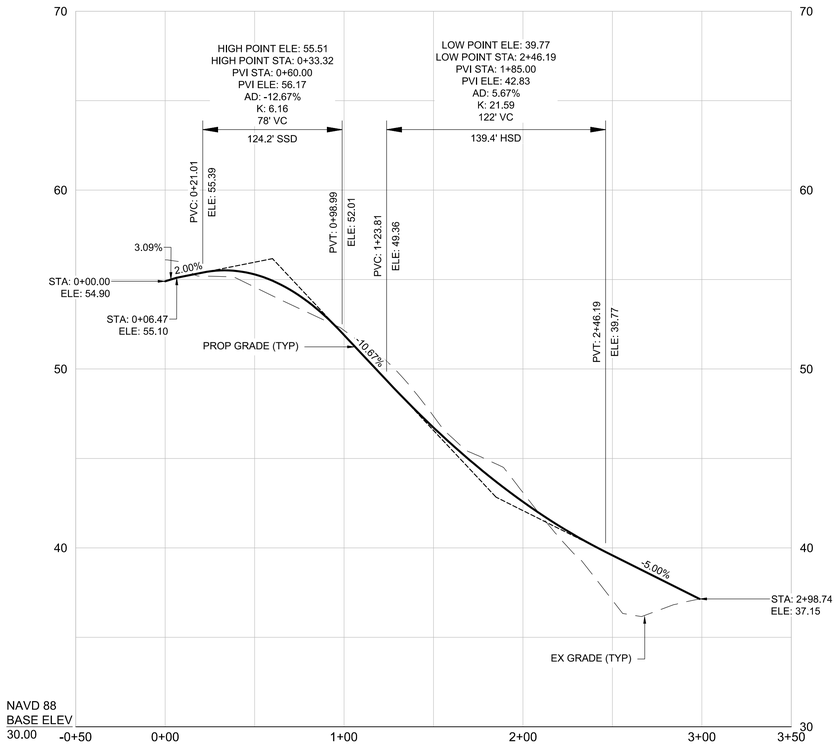
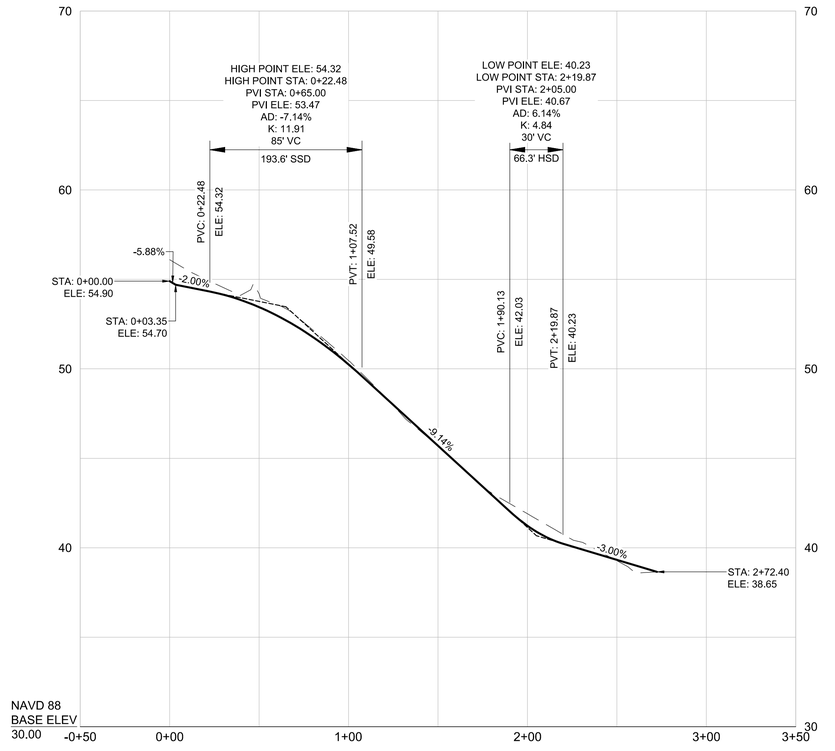
WELL 10 DRIVEWAY



WELL 11 DRIVEWAY



40 20 0 40 80
4 2 0 4 8
HORIZONTAL SCALE: 1"=40'
VERTICAL SCALE: 1"=4'

Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD
CHATHAM, MA 02633

WELLS 10 & 11 PUMPING AND TREATMENT DESIGN
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W&S Project No.: ENG21-1001
W&S File No.:

Drawing Title:
DRIVEWAY PROFILES

Sheet Number:
C104

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MILL POND

N/F
THE TOWN OF CHATHAM
BK. 14092 PG. 350
"LOT 2" (SEE MAP REF. A)
ZONING DISTRICT R60

N/F
THE TOWN OF CHATHAM
BK. 14092 PG. 350
"LOT 1" (SEE MAP REF. A)

N/F
PAUL H. LAPHAM &
LINDA LAPHAM, TRUSTEES
77 DUSTY MILLER LANE
BK. 29107 PG. 138

N/F
DAVID G. & MARIAH M.
MCMANUS
37 DUSTY MILLER LANE
BK. 21122 PG. 93

N/F
THE TOWN OF CHATHAM
BK. 14092 PG. 350
"LOT 3" (SEE MAP REF. A)
ZONING DISTRICT R60

N/F
THE TOWN OF CHATHAM
BK. 22230 PG. 213
ZONING DISTRICT R60

N/F
MARY NICKERSON
95 DUSTY MILLER LANE
BK. 3335 PG. 300
BK. 8250 PG. 126

N/F
THE TOWN OF CHATHAM
BK. 22230 PG. 213
"LOT 5" (SEE MAP REF. A)
ZONING DISTRICT R60

N/F
THE TOWN OF CHATHAM
BK. 14092 PG. 350
"LOT 4" (SEE MAP REF. A)
ZONING DISTRICT R60

N/F
THE TOWN OF CHATHAM
BK. 6636 PG. 7
ZONING DISTRICT MC

MILL FARM LANE
(PRIVATE WAY - 40' WIDE)

MILL HILL ROAD
(PUBLIC - 40' WIDE)

TOB–B6
TOB–B5
TOB–B4
TOB–A2
TOB–A1
TOB–A3

PROP 8" DI WATER MAIN FROM WELL 10 (PROVIDE BENDS AS REQUIRED)

PROP GATE VALVE (TYP)

PROP ELECTRIC & TELEMETRY SERVICE TO WELL 10 (SEE ELECTRICAL PLANS FOR SIZE & QUANTITY)

PROP 8" DI WATER MAIN FROM WELL 11

PROP ELECTRIC & TELEMETRY SERVICE TO WELL 11 (SEE ELECTRICAL PLANS FOR SIZE & QUANTITY)

(2) PROP 2,000-GAL PROPANE TANKS

PROP PROPANE POWERED GENERATOR

PROP ELECTRICAL TRANSFORMER

BENCHMARK "C"
MAG NAIL IN
24" PINE
ELEV=54.90'

PROP HYDRANT W/ 8"x8"x6" TEE & 6" GATE VALVE (TYP)

SEE INSET PLAN BELOW FOR DETAILED INFO ON UTILITY & PIPING CONNECTIONS

PROP 12" DI WATER DISCHARGE LINE

LIMIT OF WORK (TYP)

PROP 12" GATE VALVE, 12" x 8" REDUCER & 8"x8"x8" TEE

PROP ELECTRICAL CONDUIT & FIBER OPTIC CABLE TO CONNECT TO UTILITY POLE VIA RISER (SEE ELECTRICAL PLANS)

BENCHMARK "A"
MAG NAIL IN
UTILITY POLE
ELEV=41.81'

PROP UNDERGROUND ELECTRICAL CONDUIT & FIBER OPTIC CABLE RUN IN SAME TRENCH (SEE ELECTRICAL PLANS FOR SIZE & QUANTITY)

BENCHMARK "B"
MAG NAIL IN
24" OAK
ELEV=38.78'

100–FT POND SETBACK (TYP)

50–FT POND SETBACK (TYP)

R60 DISTRICT
MUNICIPAL CONSERVANCY DISTRICT

F.F.=61.5'±

EXISTING BUILDING

VERIZON #9

40 20 0 40 80
SCALE: 1"=40'

LITT
PO

PROP 1" COPPER SAMPLE TAP & CURB STOP

PROP 20" TO 10" REDUCER & TRANSITION TO 20" DI PIPE

PROP 10" DI DISHCHARGE LINE FROM BUILDING

PROP ELECTRICAL & TELEMETRY CONNECTIONS

PROP ELECTRICAL FROM GENERATOR

PROP ELECTRICAL PRIMARY FROM TRANSFORMER

PROP FIBER OPTIC CABLE VIA RISER AT STREET

PROP 6" DI FIRE PROTECTION LINE

PROP PROPANE SERVICE LINE

PROP 2" COPPER DOMESTIC WATER LINE

PROP 8" DI INFLUENT LINE FROM WELL 10

PROP 8" DI INFLUENT LINE FROM WELL 11

PROP 1" COPPER SAMPLE TAP & CURB STOP

PROP 20" TO 12" REDUCER

PROP GATE VALVE (TYP)

INSET PLAN
1" = 20'

20 10 0 20 40
SCALE: 1"=20'

Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD
CHATHAM, MA 02633

WELLS 10 & 11 PUMPING AND TREATMENT DESIGN
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JAMES I. PEARSON
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03/30/2022

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Scale: AS SHOWN

Date: MARCH 30, 2022
Drawn By: AKG
Reviewed By: JIP
Approved By: LES

W&S Project No.: ENG21-1001
W&S File No.:

Drawing Title:
PIPING & UTILITIES PLAN

Sheet Number:
C105

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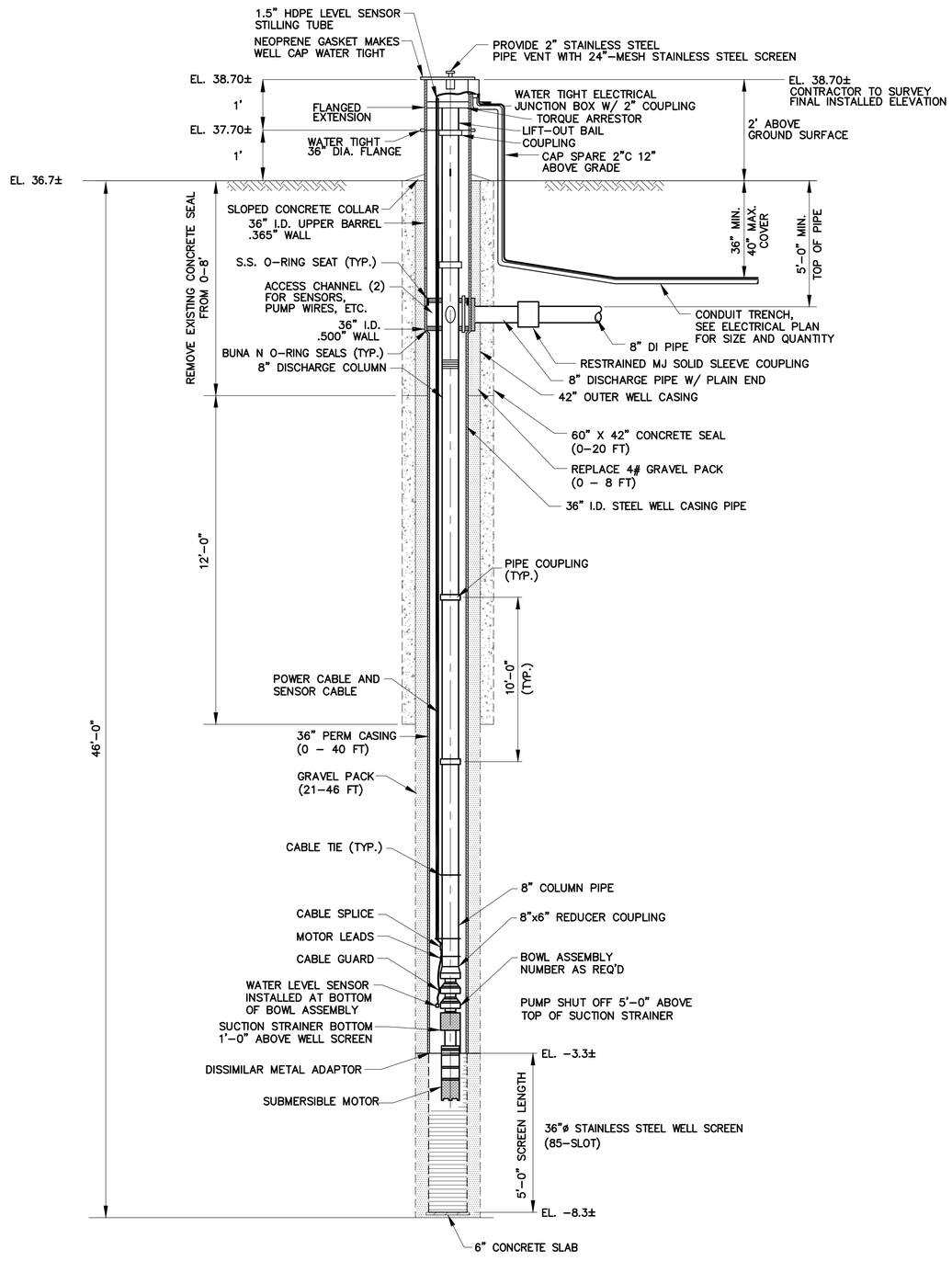
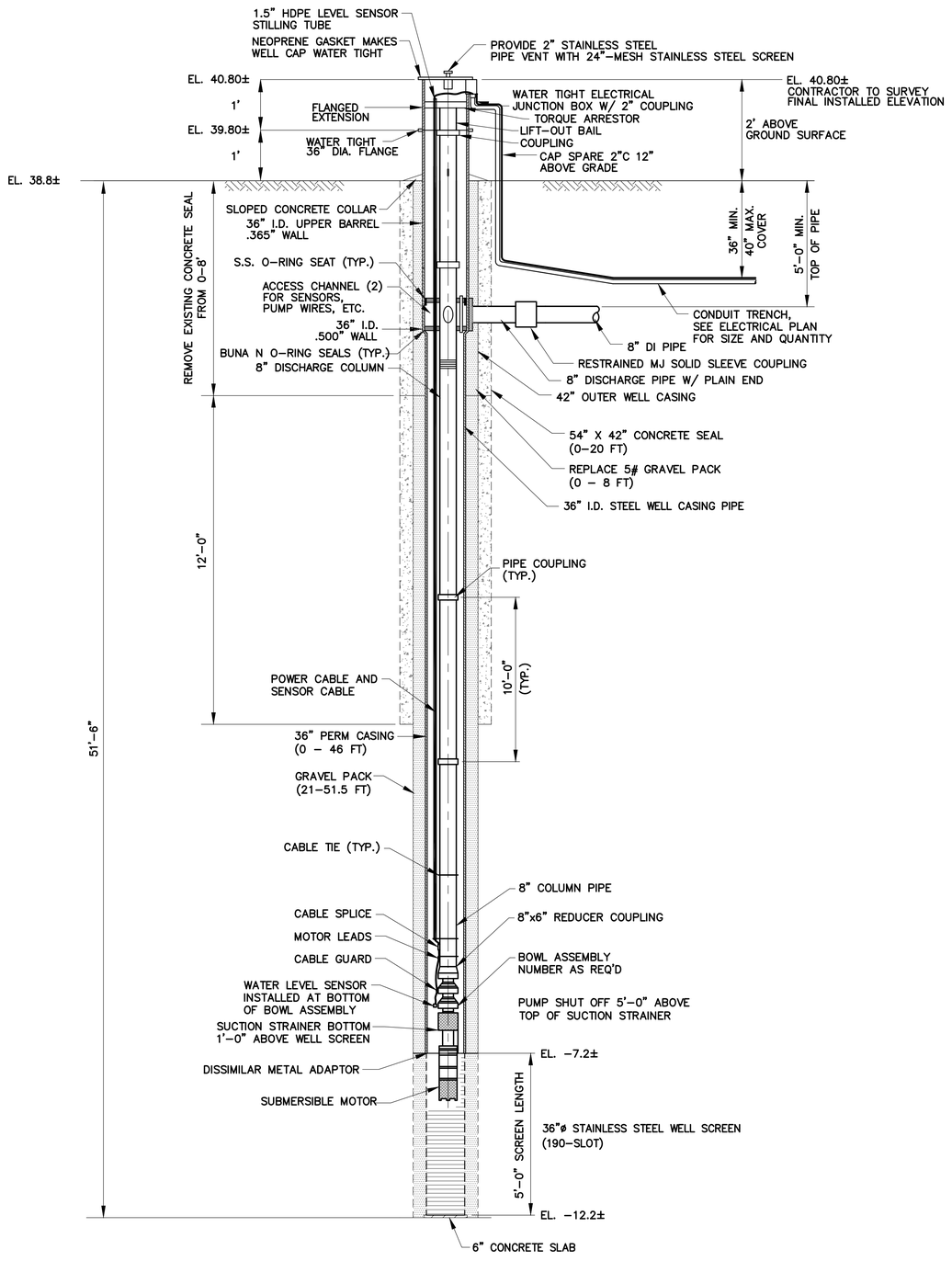

1.5" HDPE LEVEL SENSOR STILLING TUBE
NEOPRENE GASKET MAKES WELL CAP WATER TIGHT
PROVIDE 2" STAINLESS STEEL PIPE VENT WITH 24"–MESH STAINLESS STEEL SCREEN
EL. 38.70±
1'
EL. 37.70±
1'
FLANGED EXTENSION
WATER TIGHT 36" DIA. FLANGE
WATER TIGHT ELECTRICAL JUNCTION BOX W/ 2" COUPLING
TORQUE ARRESTOR
LIFT–OUT BAIL
COUPLING
CAP SPARE 2"C 12" ABOVE GRADE
EL. 38.70± CONTRACTOR TO SURVEY FINAL INSTALLED ELEVATION
2' ABOVE GROUND SURFACE
EL. 36.7±
REMOVE EXISTING CONCRETE SEAL FROM 0–8'
SLOPED CONCRETE COLLAR
36" I.D. UPPER BARREL .365" WALL
S.S. O–RING SEAT (TYP.)
ACCESS CHANNEL (2) FOR SENSORS, PUMP WIRES, ETC.
36" I.D. .500" WALL
BUNA N O–RING SEALS (TYP.)
8" DISCHARGE COLUMN
36" MIN. 40" MAX. COVER
5'–0" MIN. TOP OF PIPE
CONDUIT TRENCH, SEE ELECTRICAL PLAN FOR SIZE AND QUANTITY
8" DI PIPE
RESTRAINED MJ SOLID SLEEVE COUPLING
8" DISCHARGE PIPE W/ PLAIN END
42" OUTER WELL CASING
60" X 42" CONCRETE SEAL (0–20 FT)
REPLACE 4# GRAVEL PACK (0 – 8 FT)
36" I.D. STEEL WELL CASING PIPE
12'–0"
PIPE COUPLING (TYP.)
10'–0" (TYP.)
46'–0"
POWER CABLE AND SENSOR CABLE
36" PERM CASING (0 – 40 FT)
GRAVEL PACK (21–46 FT)
CABLE TIE (TYP.)
8" COLUMN PIPE
CABLE SPLICE
8"x6" REDUCER COUPLING
MOTOR LEADS
CABLE GUARD
BOWL ASSEMBLY NUMBER AS REQ'D
WATER LEVEL SENSOR INSTALLED AT BOTTOM OF BOWL ASSEMBLY
PUMP SHUT OFF 5'–0" ABOVE TOP OF SUCTION STRAINER
SUCTION STRAINER BOTTOM 1'–0" ABOVE WELL SCREEN
EL. –3.3±
DISSIMILAR METAL ADAPTOR
SUBMERSIBLE MOTOR
5'–0" SCREEN LENGTH
36"ø STAINLESS STEEL WELL SCREEN (85–SLOT)
EL. –8.3±
6" CONCRETE SLAB

NOTES:
1. BOTTOM OF PUMP SUCTION SET 1 FEET ABOVE THE TOP OF WELL SCREEN.
2. LEVEL SENSOR & STILLING TUBE INSTALLED AT BOTTOM OF BOWL ASSEMBLY.

WELL 10 DETAIL

ELEVATION FOR 36"x48" GRAVEL PACKED WELL

N.T.S.


1.5" HDPE LEVEL SENSOR STILLING TUBE
NEOPRENE GASKET MAKES WELL CAP WATER TIGHT
PROVIDE 2" STAINLESS STEEL PIPE VENT WITH 24"–MESH STAINLESS STEEL SCREEN
EL. 40.80±
1'
EL. 39.80±
1'
FLANGED EXTENSION
WATER TIGHT 36" DIA. FLANGE
WATER TIGHT ELECTRICAL JUNCTION BOX W/ 2" COUPLING
TORQUE ARRESTOR
LIFT–OUT BAIL
COUPLING
CAP SPARE 2"C 12" ABOVE GRADE
EL. 40.80± CONTRACTOR TO SURVEY FINAL INSTALLED ELEVATION
2' ABOVE GROUND SURFACE
EL. 38.8±
REMOVE EXISTING CONCRETE SEAL FROM 0–8'
SLOPED CONCRETE COLLAR
36" I.D. UPPER BARREL .365" WALL
S.S. O–RING SEAT (TYP.)
ACCESS CHANNEL (2) FOR SENSORS, PUMP WIRES, ETC.
36" I.D. .500" WALL
BUNA N O–RING SEALS (TYP.)
8" DISCHARGE COLUMN
36" MIN. 40" MAX. COVER
5'–0" MIN. TOP OF PIPE
CONDUIT TRENCH, SEE ELECTRICAL PLAN FOR SIZE AND QUANTITY
8" DI PIPE
RESTRAINED MJ SOLID SLEEVE COUPLING
8" DISCHARGE PIPE W/ PLAIN END
42" OUTER WELL CASING
54" X 42" CONCRETE SEAL (0–20 FT)
REPLACE 5# GRAVEL PACK (0 – 8 FT)
36" I.D. STEEL WELL CASING PIPE
12'–0"
PIPE COUPLING (TYP.)
10'–0" (TYP.)
51'–6"
POWER CABLE AND SENSOR CABLE
36" PERM CASING (0 – 46 FT)
GRAVEL PACK (21–51.5 FT)
CABLE TIE (TYP.)
8" COLUMN PIPE
CABLE SPLICE
8"x6" REDUCER COUPLING
MOTOR LEADS
CABLE GUARD
BOWL ASSEMBLY NUMBER AS REQ'D
WATER LEVEL SENSOR INSTALLED AT BOTTOM OF BOWL ASSEMBLY
PUMP SHUT OFF 5'–0" ABOVE TOP OF SUCTION STRAINER
SUCTION STRAINER BOTTOM 1'–0" ABOVE WELL SCREEN
EL. –7.2±
DISSIMILAR METAL ADAPTOR
SUBMERSIBLE MOTOR
5'–0" SCREEN LENGTH
36"ø STAINLESS STEEL WELL SCREEN (190–SLOT)
EL. –12.2±
6" CONCRETE SLAB

NOTES:
1. BOTTOM OF PUMP SUCTION SET 1 FEET ABOVE THE TOP OF WELL SCREEN.
2. LEVEL SENSOR & STILLING TUBE INSTALLED AT BOTTOM OF BOWL ASSEMBLY.

WELL 11 DETAIL

ELEVATION FOR 36"x48" GRAVEL PACKED WELL

N.T.S.

Project:
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CHATHAM, MA 02633

WELLS 10 & 11 PUMPING AND TREATMENT DESIGN
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COMMONWEALTH OF MASSACHUSETTS
03/30/2022

Issued For:
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Date: MARCH 30, 2022
Drawn By: TAH
Reviewed By: RCF
Approved By: LES

W&S Project No.: ENG21-1001
W&S File No.:

Drawing Title:
WELL DESIGN PLAN

Sheet Number:
C106

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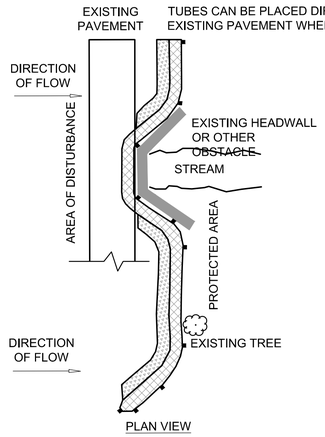


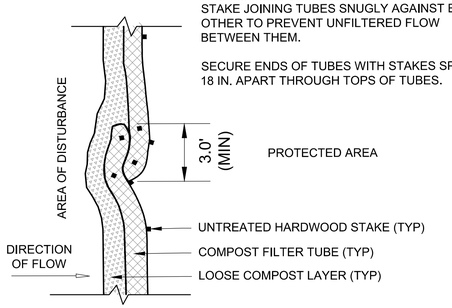
PLAN VIEW

PLACING TUBES AGAINST THE UPHILL SIDE OF WELL- ANCHORED, STATIONARY FEATURES SUCH AS EXISTING TREES CAN PROVIDE ADDITIONAL BRACING.

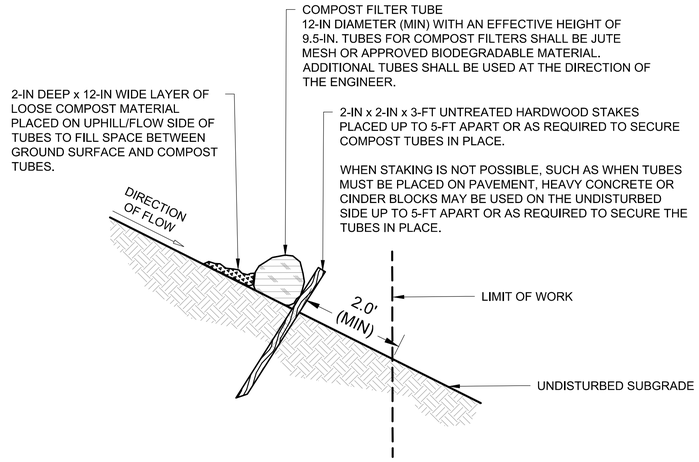
CURVE ENDS UPHILL TO PREVENT DIVERSION OF UNFILTERED RUN-OFF.

GENERAL NOTES:

1. PROVIDE A MINIMUM TUBE DIAMETER OF 12 INCHES FOR SLOPES UP TO 50 FEET IN LENGTH WITH A SLOPE RATIO OF 3H:1V OR STEEPER. LONGER SLOPES OF 3H:1V MAY REQUIRE LARGER TUBE DIAMETER OR ADDITIONAL COURSING OF FILTER TUBES TO CREATE A FILTER BERM. REFER TO MANUFACTURER'S RECOMMENDATIONS FOR SITUATIONS WITH LONGER OR STEEPER SLOPES.
2. INSTALL TUBES ALONG CONTOURS AND PERPENDICULAR TO SHEET OR CONCENTRATED FLOW.
3. DO NOT INSTALL IN PERENNIAL, EPHEMERAL OR INTERMITTENT STREAMS.
4. CONFIGURE TUBES AROUND EXISTING SITE FEATURES TO MINIMIZE SITE DISTURBANCE AND MAXIMIZE CAPTURE AREA OF STORMWATER RUN-OFF.
5. MULCH MATERIAL FOR THE FILTER TUBES SHALL BE WEED-FREE STRAW, WOOD EXCELSIOR, COMPOST, OR WOOD CHIPS, OR COIR. STRAW SHALL BE WEED FREE AND DERIVED FROM THRESHING OF GRAIN CROP.

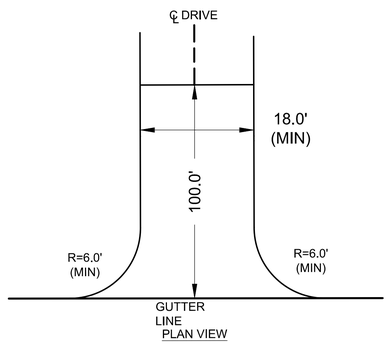

PROVIDE A 3 FT. MINIMUM OVERLAP AT ENDS OF TUBES TO JOIN IN A CONTINUOUS BARRIER AND MINIMIZE UNIMPEDED FLOW.
STAKE JOINING TUBES SNUGLY AGAINST EACH OTHER TO PREVENT UNFILTERED FLOW BETWEEN THEM.
SECURE ENDS OF TUBES WITH STAKES SPACED 18 IN. APART THROUGH TOPS OF TUBES.
AREA OF DISTURBANCE
3.0' (MIN)
PROTECTED AREA
UNTREATED HARDWOOD STAKE (TYP)
COMPOST FILTER TUBE (TYP)
LOOSE COMPOST LAYER (TYP)
DIRECTION OF FLOW

PLAN VIEW - JOINING DETAIL


COMPOST FILTER TUBE
12-IN DIAMETER (MIN) WITH AN EFFECTIVE HEIGHT OF 9.5-IN. TUBES FOR COMPOST FILTERS SHALL BE JUTE MESH OR APPROVED BIODEGRADABLE MATERIAL. ADDITIONAL TUBES SHALL BE USED AT THE DIRECTION OF THE ENGINEER.
2-IN DEEP x 12-IN WIDE LAYER OF LOOSE COMPOST MATERIAL PLACED ON UPHILL/FLOW SIDE OF TUBES TO FILL SPACE BETWEEN GROUND SURFACE AND COMPOST TUBES.
2-IN x 2-IN x 3-FT UNTREATED HARDWOOD STAKES PLACED UP TO 5-FT APART OR AS REQUIRED TO SECURE COMPOST TUBES IN PLACE.
WHEN STAKING IS NOT POSSIBLE, SUCH AS WHEN TUBES MUST BE PLACED ON PAVEMENT, HEAVY CONCRETE OR CINDER BLOCKS MAY BE USED ON THE UNDISTURBED SIDE UP TO 5-FT APART OR AS REQUIRED TO SECURE THE TUBES IN PLACE.
DIRECTION OF FLOW
2.0' (MIN)
LIMIT OF WORK
UNDISTURBED SUBGRADE

1 COMPOST FILTER TUBE

SCALE: N.T.S.



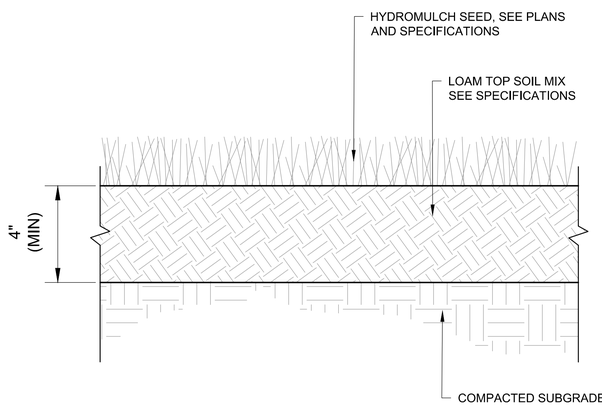
PLAN VIEW

NOTES:

1. THE LOCATION OF THE CONSTRUCTION ENTRANCE SHALL BE APPROVED BY THE OWNER PRIOR TO PLACEMENT.
2. CONSTRUCTION ENTRANCE SHALL CONSIST OF 2" CRUSHED STONE PLACED AT A DEPTH OF A MINIMUM 8 INCHES PLACED OVER GEOTEXTILE FABRIC.
3. CONTRACTOR IS RESPONSIBLE FOR DAILY INSPECTION AND ALL NECESSARY MAINTENANCE OF THE ENTRANCE.
4. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF SEDIMENTS OR ANY OTHER MATERIALS TRACKED ONTO THE STREET, AS WELL MAINTENANCE OF EROSION CONTROL MEASURES.

2 STABILIZED TEMPORARY CONSTRUCTION ENTRANCE

SCALE: N.T.S.



3 LOAM & SEED

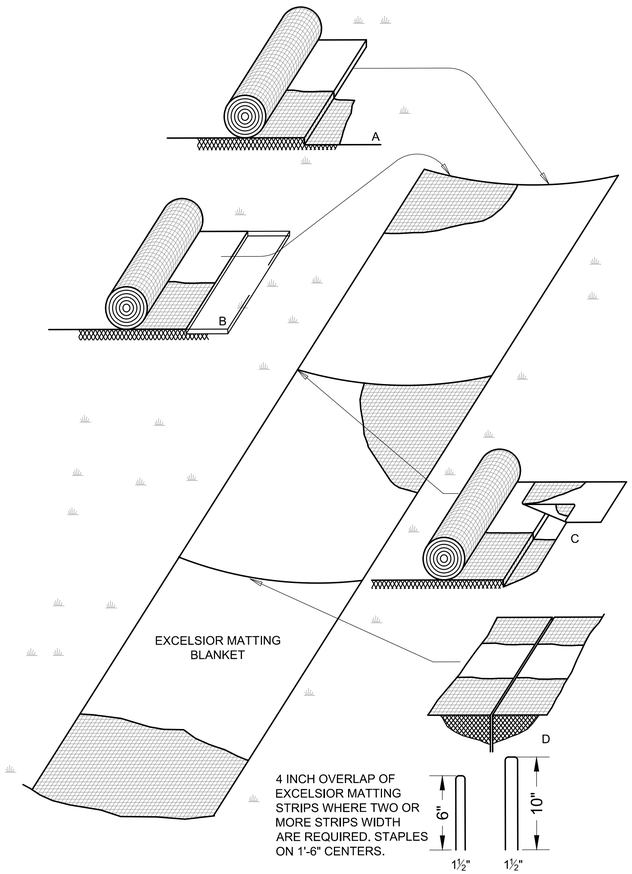
SCALE: N.T.S.

A. BURY THE TOP END OF EXCELSIOR MATTING STRIPS MINIMUM 6 INCHES.

B. TAMP THE TRENCH FULL OF SOIL. SECURE WITH ROW OF STAPLES, 6 INCH SPACING 4 INCHES DOWN FROM THE TRENCH.

C. OVERLAP- BURY UPPER END OF LOWER STRIP AS IN 'A' AND 'B'. OVERLAP END OF TOP STRIP 4 INCHES AND STAPLE.

D. EROSION STOP-FOLD EDGE OF EXCELSIOR MATTING BURIED IN SILT TRENCH AND TAMPED; DOUBLE ROW OF STAPLES.



NOTE:
1. EROSION CONTROL BLANKET TO BE USED ON ALL SLOPES GREATER THAN 2.5H:1V AS INDICATED ON GRADING PLANS.

4 EROSION CONTROL BLANKET

SCALE: N.T.S.

Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD
CHATHAM, MA 02633

WELLS 10 & 11 PUMPING AND TREATMENT DESIGN
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COMMONWEALTH OF MASSACHUSETTS
JAMES I. PEARSON
CIVIL
No. 50675
REGISTERED PROFESSIONAL ENGINEER
03/30/2022

Issued For:
BID

Scale: AS SHOWN

Date: MARCH 30, 2022
Drawn By: AKG
Reviewed By: JIP
Approved By: LES
W&S Project No.: ENG21-1001
W&S File No.:

Drawing Title:
CONSTRUCTION DETAILS

Sheet Number:
C500

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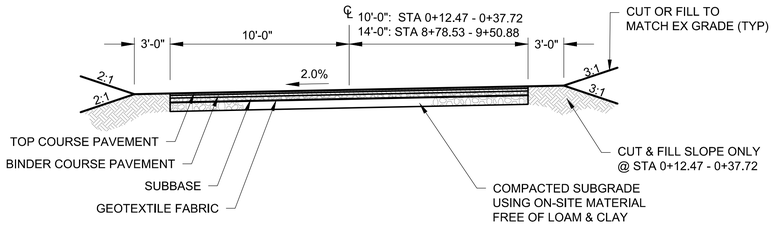
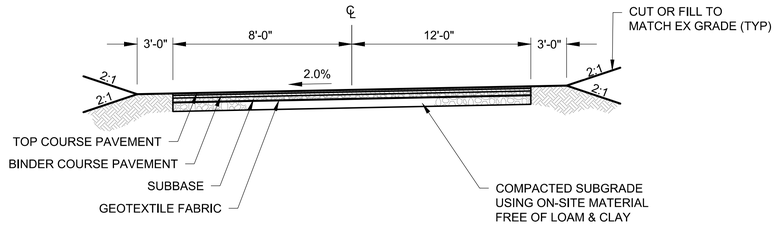
\\wes453-bvsaffil01\Projects\MA\Chatham MA\Wtr# 10 and 11 -Pumping and Treatment Design\CAD\Cad\03 Sheet\C500.dwg



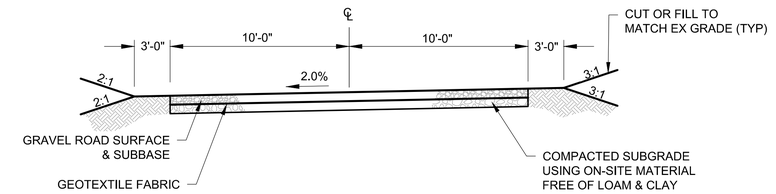
PAVED ROAD - TYPICAL SECTION 'A'

STA 0+12.47 - 0+37.72
STA 8+78.53 - 9+50.88



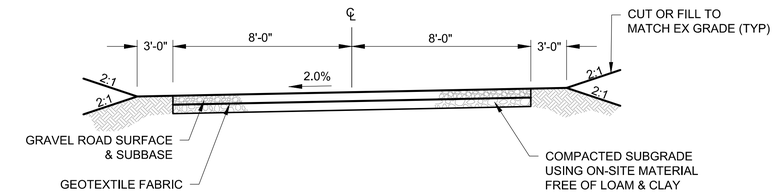
PAVED ROAD - TYPICAL SECTION 'B'

WELL 10: STA 0+00 - 0+89.24
WELL 11: STA 0+00 - 0+65.48



GRAVEL ROAD - TYPICAL SECTION 'C'

STA 0+37.72 - 8+78.53



GRAVEL ROAD - TYPICAL SECTION 'D'

WELL 10: STA 0+89.24 - 2+66.74
WELL 11: STA 0+65.48 - 2+40.40

PAVEMENT NOTES:

PROPOSED FULL DEPTH PAVEMENT:

SURFACE: 4" HOT MIX ASPHALT PAVEMENT
(1-1/2" TOP COURSE OVER 2-1/2" BINDER COURSE)

SUBBASE: 4" DENSE GRADED 3/4" CRUSHED STONE OVER
8" TYPE B* GRAVEL BORROW

PROPOSED GRAVEL ROAD:

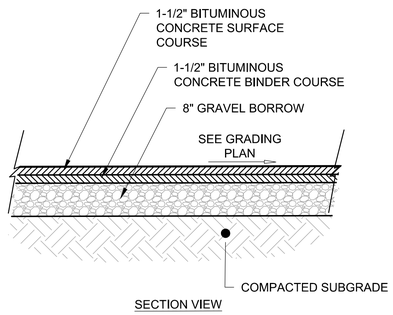
SURFACE: 4" DENSE GRADED 3/4" CRUSHED STONE

SUBBASE: 8" TYPE B* GRAVEL BORROW OVER SUITABLE
NATIVE MATERIAL

*TYPE B GRAVEL BORROW SHALL CONFORM TO MASSDOT STANDARD M1.03.0

1 ROADWAY CROSS-SECTIONS

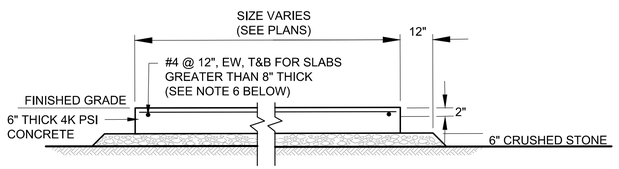
SCALE: N.T.S.



SECTION VIEW

2 BITUMINOUS CONCRETE WALKWAY

SCALE: N.T.S.

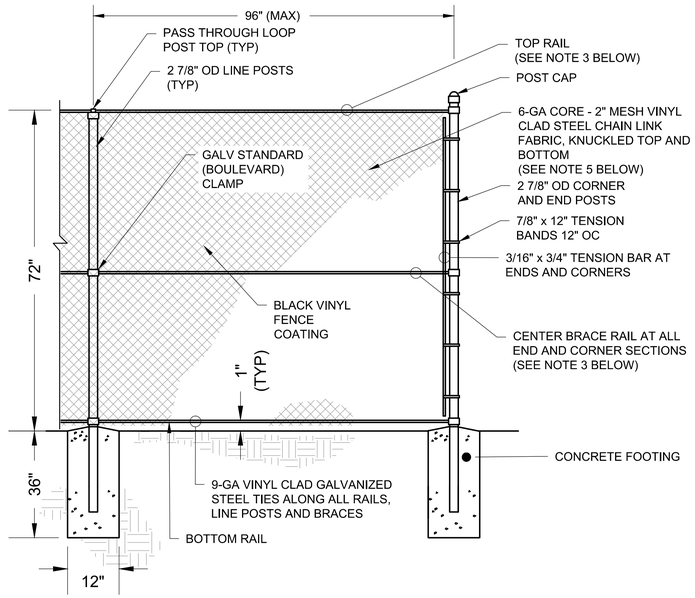

SIZE VARIES (SEE PLANS)
12"
#4 @ 12", EW, T&B FOR SLABS GREATER THAN 8" THICK (SEE NOTE 6 BELOW)
FINISHED GRADE
6" THICK 4K PSI CONCRETE
2"
6" CRUSHED STONE

NOTES:

1. GENERAL CONTRACTOR IS RESPONSIBLE FOR CONSTRUCTION OF ALL CONCRETE PADS.
2. SEE LAYOUT PLANS FOR CONCRETE PAD SIZING.
3. SEE GRADING PLANS FOR FINISH GRADE.
4. ALL CONCRETE PADS LOCATED AT DOORWAY ENTRANCES SHALL BE SET FLUSH IN PAVEMENT.
5. COORDINATE WITH ALL CONTRACTORS AND ADJUST PAD LOCATIONS IN FIELD.
6. SLABS 8" OR LESS IN THICKNESS SHALL HAVE ONE LAYER OF REINFORCING PLACED IN THE TOP ONE THIRD OF THE SLAB.

3 CONCRETE DOORWAY LANDING

SCALE: N.T.S.

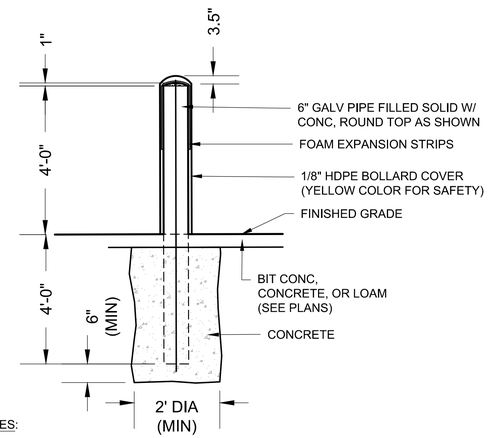

96" (MAX)
PASS THROUGH LOOP POST TOP (TYP)
2 7/8" OD LINE POSTS (TYP)
TOP RAIL (SEE NOTE 3 BELOW)
POST CAP
6-GA CORE - 2" MESH VINYL CLAD STEEL CHAIN LINK FABRIC, KNUCKLED TOP AND BOTTOM (SEE NOTE 5 BELOW)
GALV STANDARD (BOULEVARD) CLAMP
2 7/8" OD CORNER AND END POSTS
7/8" x 12" TENSION BANDS 12" OC
3/16" x 3/4" TENSION BAR AT ENDS AND CORNERS
72"
BLACK VINYL FENCE COATING
CENTER BRACE RAIL AT ALL END AND CORNER SECTIONS (SEE NOTE 3 BELOW)
1" (TYP)
CONCRETE FOOTING
36"
9-GA VINYL CLAD GALVANIZED STEEL TIES ALONG ALL RAILS, LINE POSTS AND BRACES
BOTTOM RAIL
12"

NOTES:

1. ALL FENCE PIPE SHALL BE SCH. 40, VINYL CLAD HOT DIP GALV. STEEL PIPE.
2. ALL LINE POSTS SHALL BE INSTALLED EQUALLY SPACED BETWEEN END & CORNER POSTS.
3. ALL RAILS SHALL BE 1.66" O.D. PIPE
4. ALL CLAMPS, TIES, POST TOPS, BANDS, POSTS, ETC. SHALL BE VINYL CLAD TO MATCH FABRIC.
5. PRIVACY SLATS SHALL BE USED FOR ALL ENCLOSURES. COLOR TO BE DETERMINED BY OWNER.

4 CHAIN LINK FENCE

SCALE: N.T.S.



NOTES:

1. SEE PLANS FOR BOLLARD LOCATIONS.
2. BOLLARD FOUNDATION CONCRETE TO BE 3K PSI MIN.
3. EXACT LOCATION TO BE DETERMINED IN FIELD AND APPROVED BY OWNER PRIOR TO INSTALLATION.
4. 6" GALVANIZED PIPE TO BE PROVIDED BY MISC METALS CONTRACTOR, INSTALLATION AND CONCRETE BY GC.
5. HDPE BOLLARD SLEEVE WITH 6 7/8" DIAMETER TO BE INSTALLED OVER STEEL BOLLARD USING TWO FOAM EXPANSION STRIPS.

5 STEEL PIPE BOLLARD WITH HDPE SLEEVE

SCALE: N.T.S.

Project:
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221 CROWELL ROAD
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CIVIL
No. 50675
REGISTERED PROFESSIONAL ENGINEER
03/30/2022

Issued For:
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Reviewed By: JIP
Approved By: LES

W&S Project No.: ENG21-1001
W&S File No.:

Drawing Title:
CONSTRUCTION DETAILS

Sheet Number:
C501

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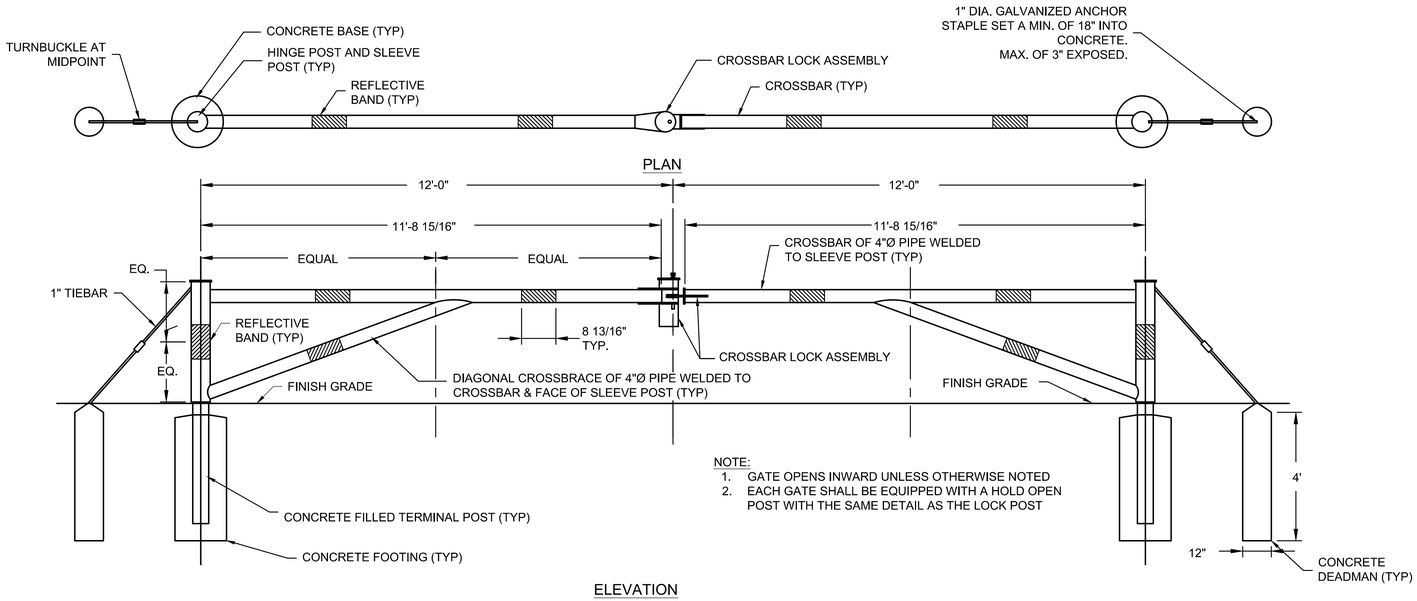
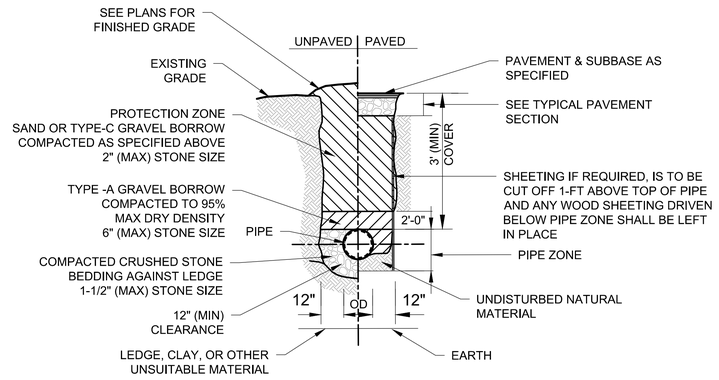


1 DOUBLE LEAF SERVICE GATE

SCALE: N.T.S.

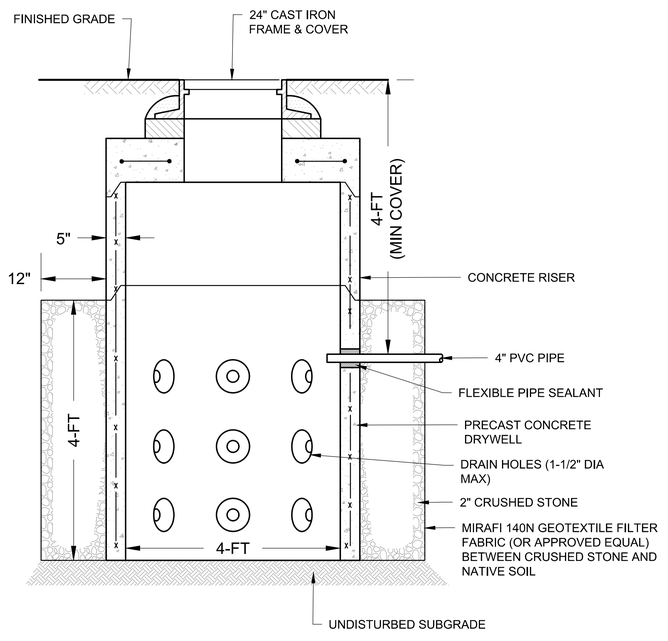

SEE PLANS FOR FINISHED GRADE
UNPAVED
PAVED
EXISTING GRADE
PAVEMENT & SUBBASE AS SPECIFIED
SEE TYPICAL PAVEMENT SECTION
PROTECTION ZONE SAND OR TYPE-C GRAVEL BORROW COMPACTED AS SPECIFIED ABOVE 2" (MAX) STONE SIZE
3' (MIN) COVER
SHEETING IF REQUIRED, IS TO BE CUT OFF 1-FT ABOVE TOP OF PIPE AND ANY WOOD SHEETING DRIVEN BELOW PIPE ZONE SHALL BE LEFT IN PLACE
TYPE -A GRAVEL BORROW COMPACTED TO 95% MAX DRY DENSITY 6" (MAX) STONE SIZE
2'-0"
PIPE
PIPE ZONE
COMPACTED CRUSHED STONE BEDDING AGAINST LEDGE 1-1/2" (MAX) STONE SIZE
12"
OD
12"
UNDISTURBED NATURAL MATERIAL
12" (MIN) CLEARANCE
LEDGE, CLAY, OR OTHER UNSUITABLE MATERIAL
EARTH

NOTES:

1. GRAVEL BORROW SHALL CONFORM TO MASSDOT SPECIFICATION M1.030
2. CRUSHED STONE BEDDING SHALL CONFORM TO MASSDOT SPECIFICATION M2.01.1

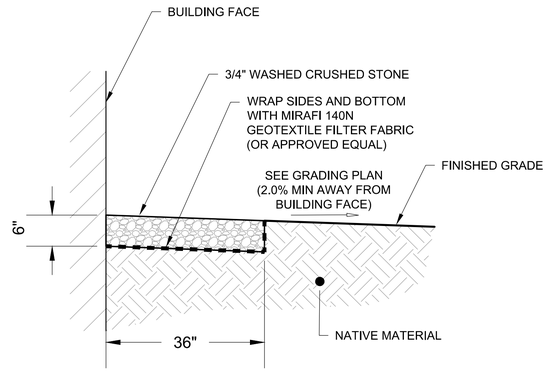
2 TYPICAL DRAIN TRENCH

SCALE: N.T.S.



3 DRYWELL

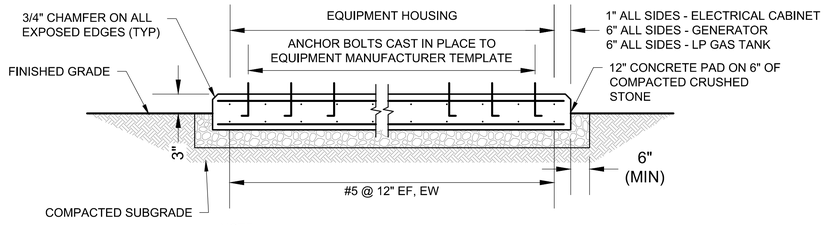
SCALE: N.T.S.


BUILDING FACE
3/4" WASHED CRUSHED STONE
WRAP SIDES AND BOTTOM WITH MIRAFI 140N GEOTEXTILE FILTER FABRIC (OR APPROVED EQUAL)
SEE GRADING PLAN (2.0% MIN AWAY FROM BUILDING FACE)
FINISHED GRADE
6"
36"
NATIVE MATERIAL

SECTION VIEW

4 STONE DRIP EDGE AT BUILDING

SCALE: N.T.S.


3/4" CHAMFER ON ALL EXPOSED EDGES (TYP)
EQUIPMENT HOUSING
1" ALL SIDES - ELECTRICAL CABINET
6" ALL SIDES - GENERATOR
6" ALL SIDES - LP GAS TANK
ANCHOR BOLTS CAST IN PLACE TO EQUIPMENT MANUFACTURER TEMPLATE
FINISHED GRADE
12" CONCRETE PAD ON 6" OF COMPACTED CRUSHED STONE
3"
6" (MIN)
#5 @ 12" EF, EW
COMPACTED SUBGRADE

NOTE:

COORDINATE ALL OPENINGS IN PAD WITH EQUIPMENT MANUFACTURER

5 CONCRETE EQUIPMENT PAD

SCALE: N.T.S.

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No. 50675
REGISTERED PROFESSIONAL ENGINEER
03/30/2022

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Approved By:	LES
W&S Project No.:	ENG21-1001
W&S File No.:	

Drawing Title:

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Sheet Number:

C502

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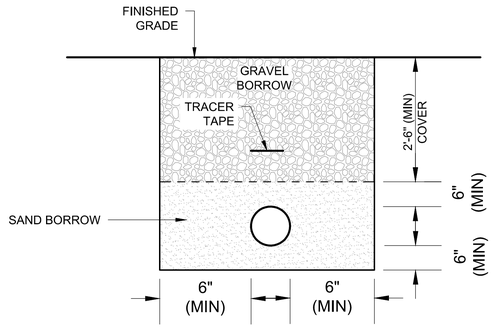
Item#13 Item#19R3\Projects\WAC\Chatham WW Wells 10 and 11 -Pumping and Treatment Design\CAD\Civil\01 Sheet\C502.dwg

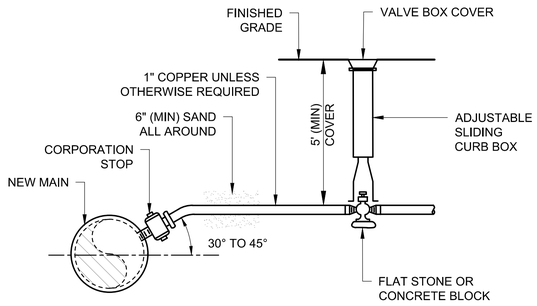


NOTES:

1. THE G.C. IS RESPONSIBLE FOR EXCAVATION & BACKFILL FOR ELECTRIC/COMMUNICATION CONDUIT. ELECTRICAL CONTRACTOR SHALL PROVIDE & INSTALL CONDUITS & SPACERS.
2. REFER TO E0.02 & E0.03 FOR CONDUIT QUANTITIES & LOCATIONS.

1 ELECTRIC & COMMUNICATION CONDUIT TRENCH

SCALE: N.T.S.



NOTES:

1. PROVIDE SADDLE FOR ALL AC AND PVC MAINS & ALL 2" OR LARGER STOPS.

2 WATER SAMPLING TAP

SCALE: N.T.S.

TABLE 1

REQUIRED LENGTH OF RESTRAINED JOINTS FROM FITTINGS (FEET)

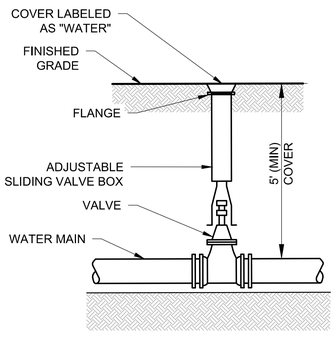
PIPE SIZE	90° BEND	45° BEND OR WYE BRANCH	22 1/2° BEND	11 1/4° BEND	PLUG, CAP OR IN-LINE VALVE	TEE (BRANCH)
6"	25 (30.5)	10.5 (12.5)	5 (6)	2.5 (3)	43 (64)	34 (51)
8"	33 (40)	13.5 (16.5)	6.5 (8)	3 (4)	55 (82)	47 (70)
10"	40 (48.5)	16.5 (20)	8 (9.5)	4 (5)	67 (100)	58 (87)
12"	47 (56.5)	19.5 (23.5)	9.5 (11.5)	4.5 (5.5)	79 (118)	70 (105)
16"	59.5 (72)	24.5 (30)	12 (14.5)	6 (7)	101 (152)	92 (139)
20"	72 (86.5)	30 (36)	14.5 (17)	7 (8.5)	123 (184)	114 (171)
24"	84 (100)	35 (41)	16.5 (20)	8 (10)	144 (216)	134 (202)
30"	100 (120)	41 (50)	20 (24)	10 (12)	174 (261)	165 (247)

NOTES:

1. RESTRAINED LENGTHS IN PARENTHESES ARE FOR PIPE WRAPPED IN POLYETHYLENE. THE OTHER ASSOCIATED LENGTHS ARE FOR PLAIN UNWRAPPED DUCTILE IRON PIPE.
2. THE CONTRACTOR SHALL USE THIS TABLE IN CONJUNCTION WITH THE APPROPRIATE PIPE SPECIFICATION SECTION.

3 WATER MAIN JOINT RESTRAINT TABLE

SCALE: N.T.S.

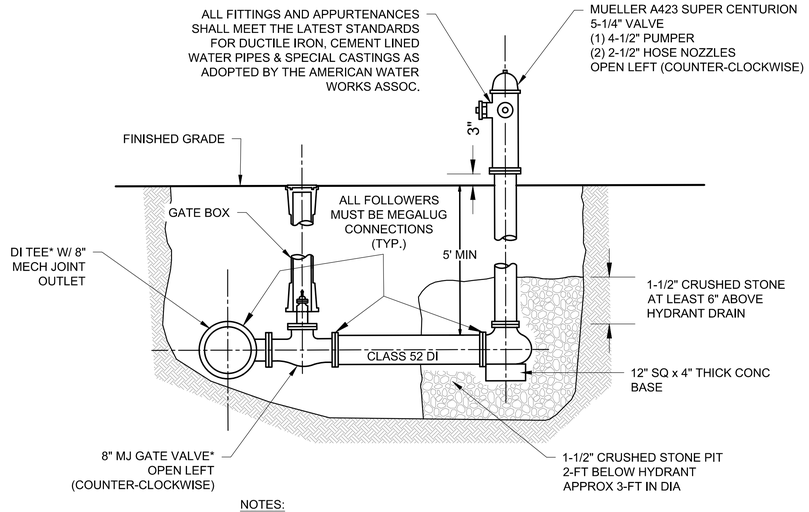


NOTES:

1. GATE VALVE TO BE LOCATED WITHIN ROADWAY PAVEMENT WHERE POSSIBLE.
2. PROPER SIZE VALVE BOX SHALL BE INSTALLED WHERE GATE VALVES ARE SHOWN ON PLANS.

4 VALVE & BOX

SCALE: N.T.S.


ALL FITTINGS AND APPURTENANCES SHALL MEET THE LATEST STANDARDS FOR DUCTILE IRON, CEMENT LINED WATER PIPES & SPECIAL CASTINGS AS ADOPTED BY THE AMERICAN WATER WORKS ASSOC.
MUELLER A423 SUPER CENTURION 5-1/4" VALVE
(1) 4-1/2" PUMPER
(2) 2-1/2" HOSE NOZZLES
OPEN LEFT (COUNTER-CLOCKWISE)
3"
FINISHED GRADE
GATE BOX
ALL FOLLOWERS MUST BE MEGALUG CONNECTIONS (TYP.)
DI TEE* W/ 8" MECH JOINT OUTLET
5' MIN
1-1/2" CRUSHED STONE AT LEAST 6" ABOVE HYDRANT DRAIN
CLASS 52 DI
12" SQ x 4" THICK CONC BASE
8" MJ GATE VALVE* OPEN LEFT (COUNTER-CLOCKWISE)
1-1/2" CRUSHED STONE PIT 2-FT BELOW HYDRANT APPROX 3-FT IN DIA

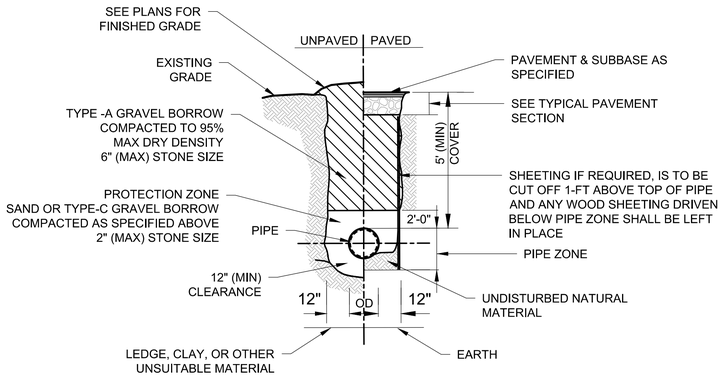
NOTES:

VALVE BOXES SHALL BE CAST IRON, ADJUSTABLE, SLIP AND MANUFACTURED IN UNITED STATES.

* ALL VALVE AND FITTINGS ARE TO BE MECHANICAL JOINTS. ALL JOINTS FROM TEE TO HYDRANT SHALL BE MECHANICALLY RESTRAINED

5 STANDARD HYDRANT & GATE VALVE

SCALE: N.T.S.


SEE PLANS FOR FINISHED GRADE
UNPAVED
PAVED
EXISTING GRADE
PAVEMENT & SUBBASE AS SPECIFIED
SEE TYPICAL PAVEMENT SECTION
TYPE -A GRAVEL BORROW COMPACTED TO 95% MAX DRY DENSITY 6" (MAX) STONE SIZE
5' (MIN) COVER
SHEETING IF REQUIRED, IS TO BE CUT OFF 1-FT ABOVE TOP OF PIPE AND ANY WOOD SHEETING DRIVEN BELOW PIPE ZONE SHALL BE LEFT IN PLACE
PROTECTION ZONE SAND OR TYPE-C GRAVEL BORROW COMPACTED AS SPECIFIED ABOVE 2" (MAX) STONE SIZE
PIPE
2'-0"
PIPE ZONE
12" (MIN) CLEARANCE
12"
OD
12"
UNDISTURBED NATURAL MATERIAL
LEDGE, CLAY, OR OTHER UNSUITABLE MATERIAL
EARTH

NOTES:

1. GRAVEL BORROW SHALL CONFORM TO MASSDOT SPECIFICATION M1.030
2. CRUSHED STONE BEDDING SHALL CONFORM TO MASSDOT SPECIFICATION M2.01.1

6 TYPICAL WATER TRENCH

SCALE: N.T.S.

Project:

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221 CROWELL ROAD
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03/30/2022

Issued For:

BID

Scale: AS SHOWN

Date: MARCH 30, 2022
Drawn By: AKG
Reviewed By: JIP
Approved By: LES

W&S Project No.: ENG21-1001
W&S File No.:

Drawing Title:

CONSTRUCTION DETAILS

Sheet Number:

C503

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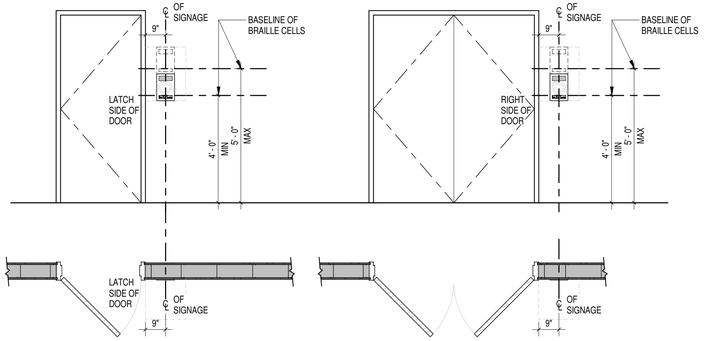
Item#13 Item#19\EP\Projects\WAC\Chatham MM Well 10 and 11 -Pumping and Treatment Design\CAD\Civil\03 Sheet\C503.dwg

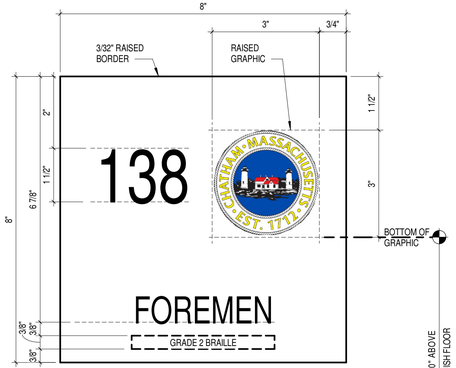


SINGLE DOOR SIGNAGE LOCATION

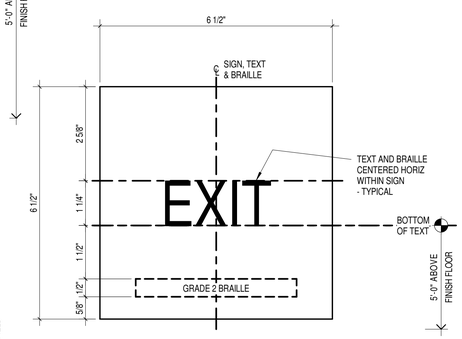
DOUBLE DOORS WITH TWO (2) ACTIVE LEAFS SINGAGE LOCATION

SIGNAGE SCHEDULE

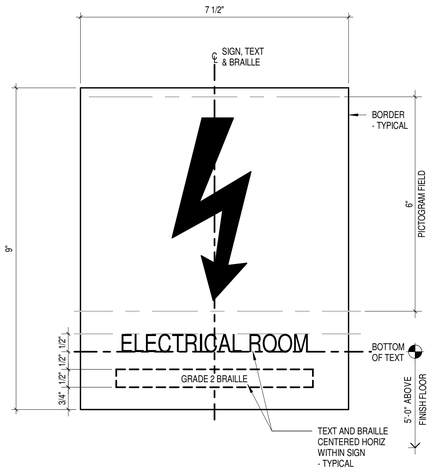
ROOM #	NAME	SIGN TYPE	QUANTITY
101	PROCESS AREA	A, B	1, 2
102	MECH. ROOM	A	1
103	ELEC. ROOM	A, C	1



A SIGN TYPE "A"
6" = 1'-0"



B SIGN TYPE "B"
6" = 1'-0"



C SIGN TYPE "C"
6" = 1'-0"

ABBREVIATION

A/C	AIR CONDITION
AC	ACOUSTICAL
ACT	ACOUSTICAL CEILING TILE
ADJ	ADJACENT
AFF	ABOVE FINISH FLOOR
ALT	ALTERNATE
ALUM	ALUMINUM
ANC BLT	ANCHOR BOLT
ANOD	ANODIZED
APPROX	APPROXIMATE
ARCH	ARCHITECT
ARGB	ABUSE RESISTANT GYPSUM BOARD
ASPH	ASPHALT
AVB	AIR VAPOR BARRIER
BC	BASE CABINET
BD	BOARD
BF	BRACE FRAME
BITUM	BITUMINOUS
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BENCH MARK
BOF	BOTTOM OF FOOTING
BOS	BOTTOM OF STEEL
BOTT	BOTTOM
BPL	BEARING PLATE
BRG	BEARING
BRK	BRICK
BS	BRICK SHELF
BSMT	BASEMENT
BVL	BEVELED
CAB	CABINET
CB	CEMENT BOARD / CATCH BASIN
CDM	CAVITY DRAINAGE MATERIAL
CF	CUBIC FEET
CH	CEILING HEIGHT
CIP	CAST IN PLACE
CJ	CONTROL JOINT
CL	CENTER LINE / COLUMN LINE
CL	CLOSET / CHAIN LINK
CLG	CEILING
CLOS	CLOSET
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CNTR	COUNTER
CO	CASED OPENING
COL	COLUMN
COMP	COMPOSITION
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTC	CONTRACTOR
CONV	CONVECTOR
COORD	COORDINATE
CORR	CORRIDOR
CPET	COMMON PATH OF EGRESS TRAVEL
CPT	CARPET
CT	CERAMIC TILE
CTR	CENTER
CW	COLD WATER
CWT	CERAMIC WALL TILE
CY	CUBIC YARD
D	DRYER
D-PART	DEMOUNTABLE PARTITION
DBL	DOUBLE
DEMO	DEMOLITION
DF	DRINKING FOUNTAIN
DH	DOUBLE HUNG
DI	DRAIN INLET
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIST	DISTANCE
DL	DRAIN LEADER
DN	DOWN
DR	DOOR
DS	DOWNSPOUT
DTL	DETAIL
DW	DISHWASHER
DWG	DRAWING
EA	EACH
EF	EACH FACE
EIFS	EXTERIOR INSULATED FINISH SYSTEM
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRIC
ELEV	ELEVATOR
EMER	EMERGENCY
ENCL	ENCLOSURE
EOC	EDGE OF CONCRETE
EP	ELECTRICAL PANEL
EQ	EQUAL
EQUIP	EQUIPMENT
ER	EXISTING TO REMAIN
ES	EXPOSED STRUCTURE
EW	EACH WAY
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FAK	FIRST AID KIT
FB	FIRE BLANKET
FC	FILE CABINET
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FF	FINISH FLOOR
FFE	FINISH FLOOR ELEVATION
FG	FIBERGLASS
FIN	FINISH
FLASH	FLASHING
FLR	FLOOR
FLUOR	FLUORESCENT
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FOUND	FOUNDATION
FP	FIREPROOF(ING)
FR	FIRE RETARDANT
FRP	FIBERGLASS REINFORCED WALL PANEL
FRTW	FIRE RETARDANT TREATED WOOD
FSB	FILED SUB BID
FT	FEET
FTG	FOOTING
FUR	FURRING
GA	GAUGE
GALV	GALVANIZED
GB	GRAB BAR
GC	GENERAL CONTRACTOR
GDRL	GUARD RAIL
GL	GLASS
GLAZ	GLAZED BLOCK
GLB	GLASS BLOCK
GN	GOOSENECK
GRT	GROUT
GWB	GYPSUM WALL BOARD
HB	HOSE BIB
HC	HANDICAP
HD	HEAVY DUTY
HDWR	HARDWARE
HM	HOLLOW METAL
HOR	HORIZONTAL
HP	HIGH POINT
HT	HEIGHT
HTR	HEATER
HVAC	HEATING, VENTILATING, & AIR CONDITIONING
HW	HOT WATER
ID	INSIDE DIAMETER
IN	INCH
INCL	INCLUDED
INFO	INFORMATION
INSUL	INSULATION
INT	INTERIOR
INV	INVERT
IRGWB	IMPACT-RESISTANT GWB
JAN	JANITOR
JST	JOIST
JT	JOINT
KD	KNOCK-DOWN
KIP	1,000 LBS
KO	KNOCKOUT
KPLT	KICKPLATE
L	LENGTH
LAM	LAMINATE
LAV	LAVATORY
LBL	LABEL
LC	LEAD COATED
LCC	LEAD COATED COPPER
LGMF	LIGHT-GAUGE METAL FRAMING
LIN	LINOLEUM
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LP	LOW POINT
LSC	LIFE SAFETY CODE
LT	LIGHT
M	METER
MANUF	MANUFACTURER
MAS	MASONRY
MAT	MATERIAL
MAX	MAXIMUM
MB	MOSITURE BARRIER
MBL	MARBLE
MBM	METAL BUILDING MANUFACTURER
MBR	MEMBER
MC	MEDICINE CABINET
MDF	MEDIUM DENSITY FIBERBOARD
MDO	MEDIUM DENSITY OVERLAY
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MIR	MIRROR
MISC	MISCELLANEOUS
ML	MATCH LINE
MLDG	MOULDING
MO	MASONRY OPENING
MOD	MODULAR
MR	MOISTURE RESISTANT
MRGB	MOISTURE RESISTANT GYPSUM BOARD
MS	METAL STUD
MTD	MOUNTED
MTL	METAL
MTP	METAL TOILET PARTITION
N/A	NOT APPLICABLE
NAT	NATURAL
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
NUM	NUMBER
NW	NEW
OA	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMETER
OH	OVERHEAD DOOR
OPNG	OPENING
OPP	OPPOSITE
OPPHAND	OPPOSITE HAND
OSB	ORIENTED STRAND BOARD
OTS	OPEN TO STRUCTURE
OW	OPERABLE WALL
OZ	OUNCE
PART BD	PARTICLE BOARD
PAV	PAVING
PCP	PRECAST CONCRETE PLANK
PERIM	PERIMETER
PL	PROPERTY LINE / PLATE
PLAM	PLASTIC LAMINATE
PLAS	PLASTIC
PLY	PLYWOOD
PMJF	PRE-MOLDED JOINT FILLER
PNT	PAINT
PR	PAIR
PREFIN	PREFINISHED
PRFB	POURED RESIN FLOOR BASE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
PTD	PAPER TOWEL DISPENSER
PTD	PAINTED
PTN	PARTITION
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
QT	QUARRY TILE
R	RISER
R & D	REMOVE & DISPOSE
R & R	REMOVE AND REPLACE
R & S	REMOVE AND SALVAGE
RAD	RADIUS
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REF	REFRIGERATOR
REFURB	REFURBISH
REINF	REINFORCEMENT
RELOC	RELOCATED
REM	REMOTE
REQ'D	REQUIRED
RES	RESILIENT
REV	REVISION
RFG	ROOFING
RFI	RIGID FOAM INSULATION
RFS	RESINOUS FLOOR SYSTEM
RH	RIGHT HAND
RL	ROOF LADDER
RM	RUBBER MAT
RM	ROOM
RO	ROUGH OPENING
RT	RUBBER TILE
RTU	ROOF TOP UNIT
RUB	RUBBER
S	SEALANT
S.L.	STRUCTURAL LINE
SACI	SPRAY-APPLIED CELLULOSE INSULATION
SACP	SECURITY ALARM CONTROL PANEL
SAFI	SPRAY-APPLIED FOAM INSULATION
SCHED	SCHEDULE
SCR	SHOWER CURTAIN ROD
SCW	SOLID CORE WOOD
SD	SOAP DISPENSER
SECT	SECTION
SF	SQUARE FEET
SH	SINGLE HUNG
SHR	SHOWER
SIM	SIMILAR
SND	SANITARY NAPKIN DISPENSER
SNV	SANITARY NAPKIN VENDOR
SOLSUR	SOLID SURFACE (COUNTER)
SPC	SPECIAL
SPEC	SPECIFICATION
SQ	SQUARE
SR	SHEET RUBBER
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURE or STRUCTURAL
SUSP	SUSPENDED or SUSPENSION
SV	SHEET VINYL
SYS	SYSTEM(S)
T & B	TOP AND BOTTOM
T & G	TONGUE AND GROOVE
TB	TRASH BARREL
TBA	TO BE ABANDONED
TBB	TILE BACKER BOARD
TBD	TO BE DETERMINED
TBOC	TOP BACK OF CURB
TEL	TELEPHONE
TEMP	TEMPORARY
THK	THICK(NESS)
THRESH	THRESHOLD
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOL	TOP OF LANDING
TOP	TOP OF PLATE
TOS	TOP OF STEEL
TOW	TOP OF WALL
TP	TRANSLUCENT PANEL
TR	TREAD
TS	TUBULAR STEEL
TTD	TOILET TISSUE DISPENSER
TW	TO WEATHER
TYP	TYPICAL
UC	UNDERCUT
UG	UNDERGROUND
UND	UNDERSIDE (OF DECK)
UNFIN	UNFINISHED
UNO	UNLESS NOTED OTHERWISE
UV	UNIT VENTILATOR
VB	VINYL BASE / VAPOR BARRIER
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VPD	VENEER PLASTER BASE
VS	VENT STACK
VT	VINYL TREAD
VTS	VINYL TRANSITION STRIP
VWB	VINYL WALL BASE
VWC	VINYL WALL COVERING
W	WASHER
W/	WITH
W/O	WITHOUT
WB	WOOD BASE
WC	WALL CABINET
WD	WOOD
WDC	WATERPROOFING, DAMPPROOFING, & CAULKING CONTRACTOR
WF	WIRE FABRIC
WG	WIRE GLASS
WH	WALL HUNG
WIN	WINDOW
WP	WATER PROTECTION
WPG	WATERPROOF(ING)
WR	WATER RESISTANT
WS	WATER STOP
WT	WEIGHT
WWF	WELDED WIRE FABRIC

SYMBOLS

EXTERIOR ELEVATION

INTERIOR ELEVATION

BUILDING SECTION

WALL SECTION

DETAIL

PARTITION TYPE

EXTERIOR WALL ASSEMBLY

DOOR TYPE or VISION PANEL (VP)

WINDOW TYPE

ROOF TYPE

SPECIFIC DEMOLITION NOTE

SPECIFIC CONSTRUCTION NOTE

CHANGE IN PLANE

LEADER

DIMENSION

CHANGE IN ELEVATION

CONTROL JOINT

ELEVATION or WORK POINT (WP)

COLUMN GRID

EXISTING COLUMN GRID

ALIGN SURFACES

REVISION MARKER

ROOM TAG

DRAWING TITLE

RIGID/SEMI-RIGID INSULATION

CONCRETE

SAND / P.C. CONCRETE

PARTICLE BOARD/MDF

PLYWOOD/MDO

FINISH WOOD

ALUMINUM

STEEL

PVC

FIBER CEMENT

CONCRETE MASONRY UNIT

BRICK

MORTAR

GROUT

TERRA COTTA

EARTH

GRAVEL

SPRAY FOAM

INSULATED METAL PANELS

WOOD STUDS/FRAMING (DIMENSIONAL LUMBER)

WOOD BLOCKING

BATT INSULATION / SOUND ATTENUATION BLANKET

MATCHLINE

SCALE: 3/8" = 1'-0"

SCALE: 6" = 1'-0"

Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD CHATHAM, MA 02633

WELLS 10 AND 11 PUMPING AND TREATMENT DESIGN
MILL HILL ROAD CHATHAM, MA 02633

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Consultants:

Revisions:

No.	Date	Description

COA:

Seal: REGISTERED ARCHITECT DANIEL G. TENNEY III No. 6688 CAMBRIDGE MA COMMONWEALTH OF MASSACHUSETTS

Issued For: BID

Scale: As indicated

Key Plan:

Date:	MARCH 30, 2022
Drawn By:	AF
Reviewed By:	BMc
Approved By:	DGT
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:

ABBREVIATIONS, SYMBOLS, LEGEND AND GENERAL NOTES

Sheet Number: A011

C:\Users\mcsukert\OneDrive - WESTON & SAMPSON ENGINEERS, Inc\Documents\Chatham Wells 10 & 11 - Arch Model V20 - sepersate_mcsukert@wseinc.com.rvt
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GENERAL NOTES

1. COORDINATE THE ARCHITECTURAL DRAWINGS WITH STRUCTURAL, PLUMBING, FIRE PROTECTION, MECHANICAL, AND ELECTRICAL / FIRE ALARM DRAWINGS FOR THE VERIFICATION OF ALL PROJECT REQUIREMENTS.

2. FINISH FIRST FLOOR SLAB ELEVATION HIGH POINT IS 55.6' FOR THIS PROJECT.

3. ALL INTERIOR DIMENSIONS ARE TAKEN FROM FACE OF STUD TO FACE OF STUD / FACE OF MASONRY UNLESS SPECIFICALLY NOTED OTHERWISE. DO NOT SCALE DRAWINGS. REFER TO ENLARGED PLANS AND DETAILS FOR FURTHER DIMENSIONING INFORMATION. ALL WORK LINES AND LEVELS SHALL BE LAID OUT BY WRITTEN DIMENSIONS. ANY DEVIATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE DESIGNER. ALL DEVIATIONS AND DISCREPANCIES SHALL BE CORRECTED BY THE CONTRACTOR BEFORE HE BEGINS HIS PORTION OF THE WORK.

4. FIRE EXTINGUISHER AND CABINET QUANTITIES AND LOCATIONS TO BE COORDINATED WITH THE TOWN FIRE DEPARTMENT PRIOR TO ORDERING AND INSTALLATION. CONFORM TO THE STATE FIRE REGS AND NFPA.

5. COORDINATE MASTER BOX, KNOX BOX, AND BEACON LOCATIONS WITH THE ELECTRICAL / FIRE ALARM DRAWINGS AND THE TOWN FIRE DEPARTMENT REQUIREMENTS. ELECTRICAL CONTRACTOR TO PROVIDE KNOX BOX THAT MEET THE TOWN FIRE DEPARTMENT REQUIREMENTS.

6. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS & CONDITIONS PRIOR TO THE WORK AND SHALL NOTIFY THE DESIGNER REGARDING ANY DISCREPANCIES.

7. THE CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS, SAMPLES, CATALOG CUTS ECT., INCLUDING COLOR CHARTS FOR PAINTS, FOR ALL INTERIOR FINISHES, TO THE DESIGNER FOR SELECTION, REVIEW AND APPROVAL WITH THE OWNER PRIOR TO FABRICATION OR INSTALLATION. THE COLORS MUST BE SUBMITTED IN A TIMELY MANNER AND TOGETHER FOR REVIEW AND COLOR BOARDS. FAILURE TO DO SO IN A TIMELY MANNER WILL FALL ON THE CONTRACTOR'S RESPONSIBILITY AND NOT ON THE OWNER. REFER TO EACH INDIVIDUAL SPECIFICATIONS FOR SIZE, QUANTITY AND TYPE OF COLOR SELECTION.

8. PERFORM ALL WORK IN ACCORDANCE WITH THE STATE BUILDING CODE, AS WELL AS LOCAL CODES AND ORDINANCES.

9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS, BACKCHARGES AND FEES AS REQUIRED BY THE TOWN.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY REMOVAL AND LEGAL DISPOSAL OF ALL DEBRIS OFF SITE.

11. THE CONTRACTOR SHALL SEAL ALL THROUGH-WALL & FLOOR PENETRATIONS WITH 3M BARRIER CAULK (O.A.E.) AND SEALANT ON USG SAFING 2500 PSI GROUT. U.N.O. INSTALL ANY REQUIRED FIRE RATED PARTITIONS TO UNDERSIDE OF FLOOR AND ROOF DECK, INCLUDING DEFLECTION HEAD FIRE SAFING.

12. INSTALL A CONTINUOUS SEALANT BEAD ON BACKER ROD AT ALL JUNCTURES OF DISSIMILAR MATERIALS (E.G.: METAL TO CMU, STEEL TO ALUMINUM) AND ALL MATERIAL JOINTS AS REQUIRED BY THE MANUFACTURER'S SPECIFICATION AND RECOMMENDATIONS, INDUSTRY STANDARDS AND GOOD PRACTICE.

13. PROVIDE CONTINUOUS GALVANIZED METAL EDGE TRIM AT ALL GWB WORK.

14. THE CONTRACTOR SHALL INSTALL ALL INTERIOR FINISHES AT ALL SURFACES INDICATED ON THE DRAWINGS IN CONFORMANCE TO STATE BUILDING CODE. ALL DOORS SHALL HAVE LEVER HARDWARE TO CONFORM TO 521 CMR.

15. INSTALL USG .093 (OR APPROVED EQUAL) CONTROL JOINTS AT 30'-0" O.C. MAX. OR AS PER MANUFACTURER'S SUGGESTED DETAILS AND SPECIFICATIONS.

16. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A GAP FILLING SYSTEM OR OTHER SYSTEM WHICH SPANS ANY GAP IN THE EXTERIOR WALL SYSTEM WHICH DOES NOT MEET THE MAXIMUM SPAN OF THE APPROVED AIR BARRIER MEMBRANE SYSTEM. THIS SYSTEM SHALL BE PROVIDED TO ALLOW FOR A COMPLETE AIR BARRIER MEMBRANE INSTALLATION. THE SYSTEM SHALL BE COMPATIBLE WITH THE APPROVED AIR BARRIER PRODUCT AND SHALL BE APPROVED BY THE DESIGNER PRIOR TO INSTALLATION.

17. ALL STRUCTURAL ELEMENTS WHICH PASS IN FRONT OF WINDOWS / CLERESTORIES SHALL BE BACK PAINTED.

18. ALL STRUCTURAL ELEMENTS SHOWN ON THE ARCHITECTURAL DRAWINGS ARE FOR INFORMATION ONLY. REFER TO STRUCTURAL DRAWINGS FOR EXACT SIZES AND LOCATION OF STRUCTURAL ELEMENTS.

19. THE CONTRACTOR SHALL PROVIDE SUPPLEMENTAL FRAMING AND OR BLOCKING AS NECESSARY TO SUPPORT ALL EXTERIOR WALL MOUNTED ELEMENTS.

20. ALL OPENINGS IN EXTERIOR WALLS FOR PLUMBING, FIRE PROTECTION, MECHANICAL, AND ELECTRICAL / FIRE ALARM SYSTEMS SHALL BE SEALED WEATHER-TIGHT BY THE CONTRACTOR. CONTRACTOR TO PROVIDE FIRE RATED SEALANTS AS REQUIRED AT FIRE RATED WALL, FLOOR, CEILING, AND ROOF ASSEMBLIES.

21. THE CONTRACTOR IS TO FIELD MEASURE OH DOOR OPENINGS TO ENSURE PROPER FIT OF OH DOORS.

22. ALL EXPOSED SURFACES (INCLUDING, BUT NOT LIMITED TO; WALLS, UNDERSIDE OF EXPOSED ROOF AND FLOOR DECK, STRUCTURAL STEEL, MISCELLANEOUS METALS, DOORS/FRAMES, DUCTWORK, CONDUIT, AND PIPING) SHALL BE PRIMED AND PAINTED.

23. BLOCKING SHALL BE PROVIDED FOR ALL WALL MOUNTED EQUIPMENT (INCLUDING, BUT NOT LIMITED TO; PLUMBING FIXTURES, TOILET ACCESSORIES, UTILITY SINKS, FIRE EXTINGUISHER CABINETS, SHELVING, COUNTERS, CASEWORK, CABINETS, MEDIA EQUIPMENT, AND WINDOW TREATMENTS). PROVIDE ADDITIONAL METAL STUD FRAMING AS REQUIRED TO SUPPORT BLOCKING.

24. THE AIR BARRIER MEMBRANE (ABM) SHALL BE CONTINUOUS THROUGH THE BUILDING ENVELOPE AND BETWEEN THE WALL AND ROOF SYSTEMS INSTALLED ON THE WINTER WARM SIDE OF THE INSULATION. OPENINGS AND PENETRATIONS IN THE BUILDING ENVELOPE SHALL BE SEALED WITH SEALANT MATERIALS OR CLOSED WITH GASKETING SYSTEMS WHICH IS COMPATIBLE WITH THE ABM SYSTEM AND MEETS THE PERFORMANCE REQUIREMENTS IN THE SPEC. SYSTEM SHALL BE COMPATIBLE WITH THE CONSTRUCTION MATERIALS AND LOCATION. JOINTS AND SEAMS SHALL BE SEALED IN THE SAME MANNER OR TAPED OR COVERED WITH A MOISTURE VAPOR-PERMEABLE WRAPPING MATERIAL. SEALING MATERIALS SPANNING JOINTS BETWEEN CONSTRUCTION MATERIALS SHALL ALLOW FOR EXPANSION AND CONTRACTION OF THE CONSTRUCTION MATERIALS. AT ALL OH DOOR JAMBS AND HEADERS, THE ABM SHALL TERMINATE AT THE STEEL FACE WHERE THE INSULATION ABUTS STEEL FRAMED OPENINGS. TERMINATE ABM ON THE INSIDE FACE OF EXTERIOR WALL SYSTEM AT DOORS, WINDOWS, LOUVERS, AND CLERESTORIES. THE TERMS VAPOR RETARDER, AND AIR MOISTURE BARRIER ARE SYNONYMOUS WITH ABM.

25. ALL WALL/PARAPET FLASHING SHALL TERMINATE WITH A MINIMUM 8" VERTICAL LEG TO ALLOW FOR PROPER INTERFACE WITH THE ABM. ABM SHALL BE INSTALLED BEHIND FLASHING AND THE FLASHING SHALL BE INTEGRATED INTO THE ABM SYSTEM USING A SELF-ADHERED MEMBRANE FLASHING WITH MINIMUM OVERLAP REQUIREMENTS PER MANUFACTURER.

26. ALL EXTERIOR AND INTERIOR MATERIAL SURFACE COLOR AND TEXTURES SHALL BE SELECTED BY THE DESIGNER FROM THE MANUFACTURES STANDARD & PREMIUM FINISH / COLOR SELECTIONS. ONCE ALL COLORS HAVE BEEN SUBMITTED, THE OWNER WILL REVIEW AND PROVIDE GUIDANCE ON COLORS FOR INCLUSION IN THE MOCK-UP REFERENCED IN DIVISION 1 OF THE SPECIFICATIONS.

27. DETAILS AND NOTES SHOWN ON THE ARCHITECTURAL DRAWINGS SHALL BE APPLICABLE TO ALL PARTS OF THE ARCHITECTURAL WORK EXCEPT WHERE SPECIFICALLY REQUIRED OTHERWISE BY THE CONTRACT DOCUMENTS. CONDITIONS NOT SPECIFICALLY SHOWN SHALL BE SIMILAR TO THOSE SHOWN FOR LIKE CONDITIONS AS DETERMINED BY THE DESIGNER.

28. PROVIDE ALL ACCESSIBLE FIXTURES, CONTROLS & ACCESSORIES, AND APPROPRIATE CLEARANCES, AS REQUIRED FOR COMPLIANCE W/ STATE BUILDING CODE W/ ALL AMENDMENTS, TYP.

29. SEALANT DEPTH AT ALL EXTERIOR OPENINGS SHALL BE EQUAL TO THE WIDTH OF THE JOINT.

30. FOR SITE LEGEND REFER TO DRAWING SERIES C001.

31. FOR STRUCTURAL LEGEND REFER TO DRAWING SERIES S000.

32. FOR WALL TYPES, REFER TO DRAWING SERIES A021.

33. ALL DIMENSIONS ARE TO FACE OF MASONRY, FACE OF METAL STUD, AND TO THE CENTERLINE OF COLUMN, UNLESS OTHERWISE NOTED.

34. FOR SOFFIT AND ROOF DETAILS, REFER TO DRAWING SERIES A102.

35. FOR DOOR NUMBERS AND DETAILS, REFER TO DRAWING SERIES A801.

36. FOR PLUMBING LEGEND, REFER TO DRAWING SERIES P000.

37. FOR FIRE PROTECTION LEGEND, REFER TO DRAWING SERIES FP000.

38. FOR MECHANICAL LEGEND, REFER TO DRAWING SERIES M000.

39. FOR ELECTRICAL LEGEND, REFER TO DRAWING SERIES E000.

40. ALL NOTES AND DIMENSIONS DESIGNATED "TYPICAL" APPLY TO ALL LIKE OR SIMILAR CONDITIONS THROUGHOUT THE PROJECT.

41. CONTRACTOR(S) TO TAKE AND VERIFY ALL DIMENSIONS AND CONDITIONS OF THE WORK AND BE RESPONSIBLE FOR COORDINATION OF THE SAME. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO START OF WORK.

WALL TYPE NOTES

1. WALL TYPES LISTED REPRESENT SEVERAL TYPES OF WALL CONSTRUCTION, ALL OF WHICH MAY NOT BE USED ON THIS PROJECT. REFER TO FLOOR PLANS FOR WALL TYPE DESIGNATIONS.

2. EXTEND ALL METAL STUDS AND GYPSUM BOARD TO UNDERSIDE OF DECK. WHERE ABUSE RESISTANT GYPSUM BOARD (ARGB) IS USED, EXTEND ARGB TO 6" ABOVE FINISH CEILING, CONTINUE WITH GYPSUM BOARD TO UNDERSIDE OF DECK.

3. AT ALL NON-FIRE RATED PARTITIONS, FILL VOIDS WITH SOUND ATTENUATION INSULATION INCLUDING, BUT NOT LIMITED TO, FLUTES IN METAL FLOOR / ROOF DECK, VOIDS BETWEEN PARTITIONS AND STRUCTURAL MEMBERS, PENETRATIONS OF DUCTWORK, ELECTRICAL CONDUIT, PIPING, ETC.

4. GYPSUM BOARD AND ARGB USED IN A ONE, TWO, OR THREE HOUR FIRE-RESISTANCE RATED PARTITION MUST BEAR THE U.L. CLASSIFICATION MARKING.

SMOKE PARTITIONS:

5. NON-FIRE-RESISTANCE RATED PARTITIONS REQUIRED TO RESIST THE PASSAGE OF SMOKE ARE DESIGNATED AS "SMOKE RESISTANT" WITH AN ASTERISK (*) LOCATED BELOW THE WALL TYPE DESIGNATION. EXTEND ALL SMOKE PARTITIONS TO THE UNDERSIDE OF METAL FLOOR / ROOF DECK AND / OR STRUCTURE ABOVE. PENETRATIONS AND VOIDS SHALL BE FIRESTOPPED IN ACCORDANCE WITH DIVISION 07 SPECIFICATION SECTION "FIRESTOPPING" ALL HEAD-OF-WALL JOINTS AND FLOOR-TO-WALL JOINTS SHALL BE SEALED IN ACCORDANCE WITH SPECIFICATION SECTION "FIRESTOPPING".

SMOKE BARRIERS:

6. FOR THE PURPOSE OF SUBDIVIDING BUILDING SPACES, SMOKE BARRIERS ARE FIRE-RESISTANCE RATED PARTITIONS, DESIGNATED WITH AN "S" LOCATED ADJACENT TO THE WALL TYPE DESIGNATION.

7. PROVIDE SMOKE DAMPERS AT DUCTWORK PENETRATIONS IN ALL ONE, TWO, AND THREE HOUR FIRE-RESISTANCE RATED SMOKE BARRIERS.

8. REFER TO FIRE-RESISTANCE RATED CONSTRUCTION FOR ADDITIONAL REQUIREMENTS.

FIRE-RESISTANCE RATED CONSTRUCTION:

9. ALL FIRE-RESISTANCE RATED PARTITIONS RESIST THE PASSAGE OF SMOKE AND ARE CONSIDERED SMOKE RESISTANT WITHOUT THE ASTERISK DESIGNATION. EXTEND ALL FIRE-RESISTANCE RATED PARTITIONS TO THE UNDERSIDE OF METAL FLOOR/ROOF DECK AND/OR STRUCTURE ABOVE. PENETRATIONS AND VOIDS SHALL BE FIRESTOPPED IN ACCORDANCE WITH SPECIFICATION SECTION "FIRESTOPPING". ALL HEAD-OF-WALL JOINTS AND FLOOR-TO-WALL JOINTS SHALL BE SEALED IN ACCORDANCE WITH SPECIFICATION SECTION "FIRE-RESISTIVE JOINT SYSTEMS."

X — WALL TYPE

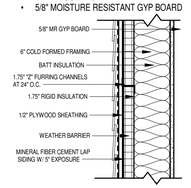
12'-0" A.F.F. — (HEIGHT OF WALL IF APPLICABLE, IF NO DIMENSION, THEN WALL IS TO UNDERSIDE OF DECK)

10. GYPSUM BOARD AT EXTERIOR WALLS IS TO GO TO THE UNDERSIDE OF DECK AND HAVE THE ROOF VAPOR BARRIER / FABRIC LINER EXTEND AND SEALED AGAINST THE BACK SIDE OF THE GYPSUM BOARD.

EXTERIOR WALL ASSEMBLIES

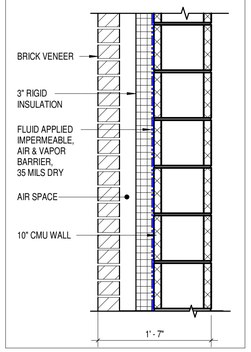
TYPE A UPPER

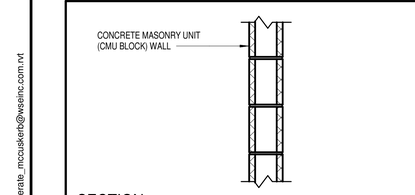
WALL ASSEMBLY
EXTERIOR
- FIBER CEMENT LAP SIDING - 5" EXPOSURE
- WEATHER BARRIER
- 1/2" PLYWOOD SHEATHING
- 1.75" "Z" FURRING CHANNELS AT 24" O.C.
- 1.75" RIGID INSULATION
- 6" COLD FORMED METAL FRAMING AT 16" O.C. MAX
- BATT INSULATION
- 5/8" MOISTURE RESISTANT GYP BOARD


5/8" MR GYP BOARD
6" COLD FORMED FRAMING
BATT INSULATION
1.75" "Z" FURRING CHANNELS AT 24" O.C.
1.75" RIGID INSULATION
1/2" PLYWOOD SHEATHING
WEATHER BARRIER
MINERAL FIBER CEMENT LAP SIDING W/ 5" EXPOSURE

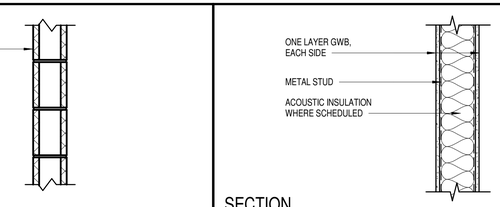
TYPE A LOWER

WALL ASSEMBLY
(1' - 7" TOTAL THICKNESS)
EXTERIOR
- BRICK VENEER
- AIR SPACE
- 3" RIGID INSULATION
- CONTINUOUS AIR & VAPOR BARRIER
- 10" CMU

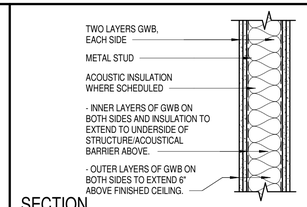




SECTION

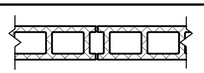


SECTION


TWO LAYERS GWB, EACH SIDE
METAL STUD
ACOUSTIC INSULATION WHERE SCHEDULED
- INNER LAYERS OF GWB ON BOTH SIDES AND INSULATION TO EXTEND TO UNDERSIDE OF STRUCTURE/ACOUSTICAL BARRIER ABOVE.
- OUTER LAYERS OF GWB ON BOTH SIDES TO EXTEND 6" ABOVE FINISHED CEILING.

SECTION

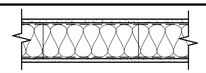
PLAN



MARK	CORE SIZE	GWB THICK	GWB HEIGHT	TOTAL THICK	ACOUSTIC INSUL	FIRE RATING / UL DESIGN NO.
8	6" NOM	-	-	5 5/8"	NO	-
8 - 1H	6" NOM	-	-	5 5/8"	NO	1 HR PARTITION - U906
8A	8" NOM	-	-	7 5/8"	NO	-
8A - 1H	8" NOM	-	-	7 5/8"	NO	1 HR PARTITION - U905
8A - 2H	8" NOM	-	-	7 5/8"	NO	2 HR PARTITION - U905
8B	12" NOM	-	-	11 5/8"	NO	-
8B - 1H	12" NOM	-	-	11 5/8"	NO	1 HR PARTITION - U905
8B - 2H	12" NOM	-	-	11 5/8"	NO	2 HR PARTITION - U905

8 CMU WALLS

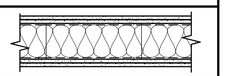
PLAN



MARK	CORE SIZE	GWB THICK	GWB HEIGHT	TOTAL PARTITION THICK	ACOUSTIC INSUL	FIRE RATING / UL DESIGN NO.
6A	6"	5/8"	FULL HEIGHT	7 1/4"	YES	-

6 6" METAL STUD - 1 LAYER GWB - BOTH SIDES

PLAN



MARK	CORE SIZE	GWB THICK	GWB HEIGHT	TOTAL PARTITION THICK	ACOUSTIC INSUL	FIRE RATING / UL DESIGN NO.
7 - 2H	6"	5/8"	FULL HEIGHT	8 1/2"	YES	2 HR PARTITION - U411

7 6" METAL STUD - 2 LAYERS GWB - BOTH SIDES

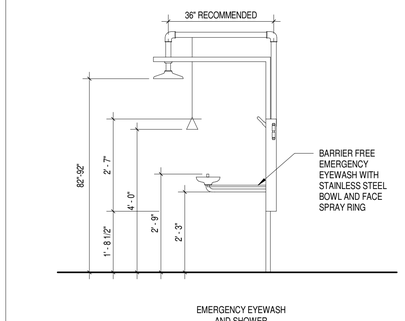
TYPICAL DEVICE MOUNTING HEIGHTS

ELECTRICAL EQUIPMENT MOUNTING HEIGHT DIMENSIONS ARE TO CENTER OF DEVICE UNLESS OTHERWISE NOTED:

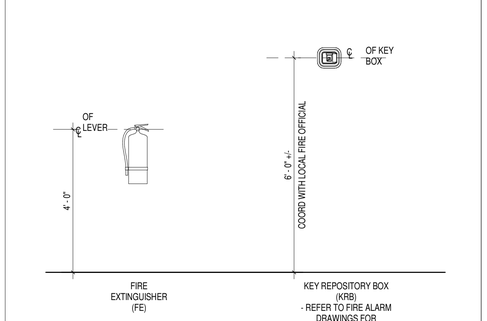
- RECEPTACLES: 18" A.F.F. AT LOCATIONS ABOVE CASEWORK, MOUNT BOTTOM OF RECEPTACLE AT 2" ABOVE BACKSPLASH. AT LOCATIONS BELOW CASEWORK, MOUNT AT 24" A.F.F.
- EXTERIOR RECEPTACLES: 24" A.F.F.
- SWITCHES: 48" A.F.F.
- BOILER EMERGENCY SWITCH: 60" A.F.F.
- DATA/PHONE OUTLETS: 18" A.F.F.
- WALL MOUNTED CLOCKS AND SPEAKERS: COORDINATE LOCATION ABOVE DOOR WITH CEILING HEIGHT. IF THE CLOCK AND SPEAKER DO NOT FIT, PLACE AT 7'-6" A.F.F. NEXT TO DOOR. COORDINATE WITH BLOCK COURSING AS OCCURS. CONSULT DESIGNER IF CONDITIONS DIFFER.
- FIRE ALARM PULL STATIONS: 48" A.F.F.
- AREA OF REFUGE CALL STATION: 48" A.F.F.
- EMERGENCY SHUT-OFF SWITCH/PUSH BUTTON: 48" A.F.F.
- EMERGENCY CALL SWITCH: 35" A.F.F.
- EMERGENCY CALL BELL/LIGHT: 7'-6" A.F.F.
- FIRE ALARM VISUAL/AUDIO INDICATING UNITS: 6'-8" TO BOTTOM OF DEVICE.
- WALL MOUNTED EXIT SIGNS: 8" ABOVE DOOR OR 7'-6" A.F.F.

DOOR HARDWARE MOUNTING HEIGHT DIMENSIONS ARE TO CENTER OF HARDWARE:

- PULL: 42"
- PUSH PLATE: 45"



EMERGENCY EYEWASH AND SHOWER


℄ OF KEY BOX
OF LEVER
4' - 0"
6' - 0" +/-
COORD WITH LOCAL FIRE OFFICIAL
FIRE EXTINGUISHER (FE)
KEY REPOSITORY BOX (KRB)
- REFER TO FIRE ALARM DRAWINGS FOR ADDITIONAL INFO

0' 1' 2' 4' — SCALE: 1/2" = 1'-0"

0' 6" 1' 2' — SCALE: 1" = 1'-0"

Project:
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Consultants:

Revisions:

No.	Date	Description

COA:

Seal:

REGISTERED ARCHITECT — DANIEL G. TENNEY — No. 6688 — CAMBRIDGE MA — COMMONWEALTH OF MASSACHUSETTS

Issued For:
BID

Scale: As indicated

Key Plan:

Date:	MARCH 30, 2022
Drawn By:	AF
Reviewed By:	BMc
Approved By:	DGT
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
GENERAL NOTES

Sheet Number:
A021

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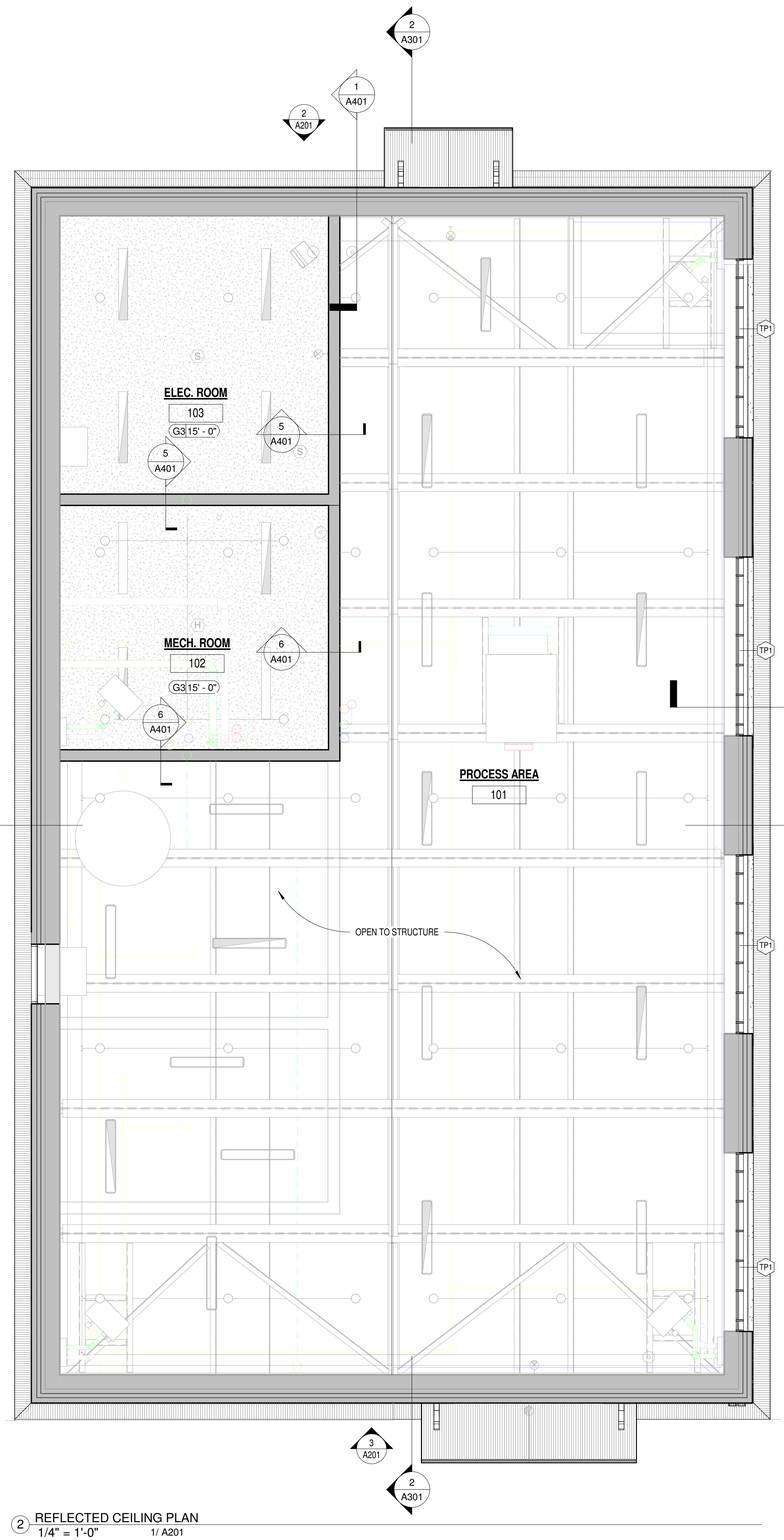
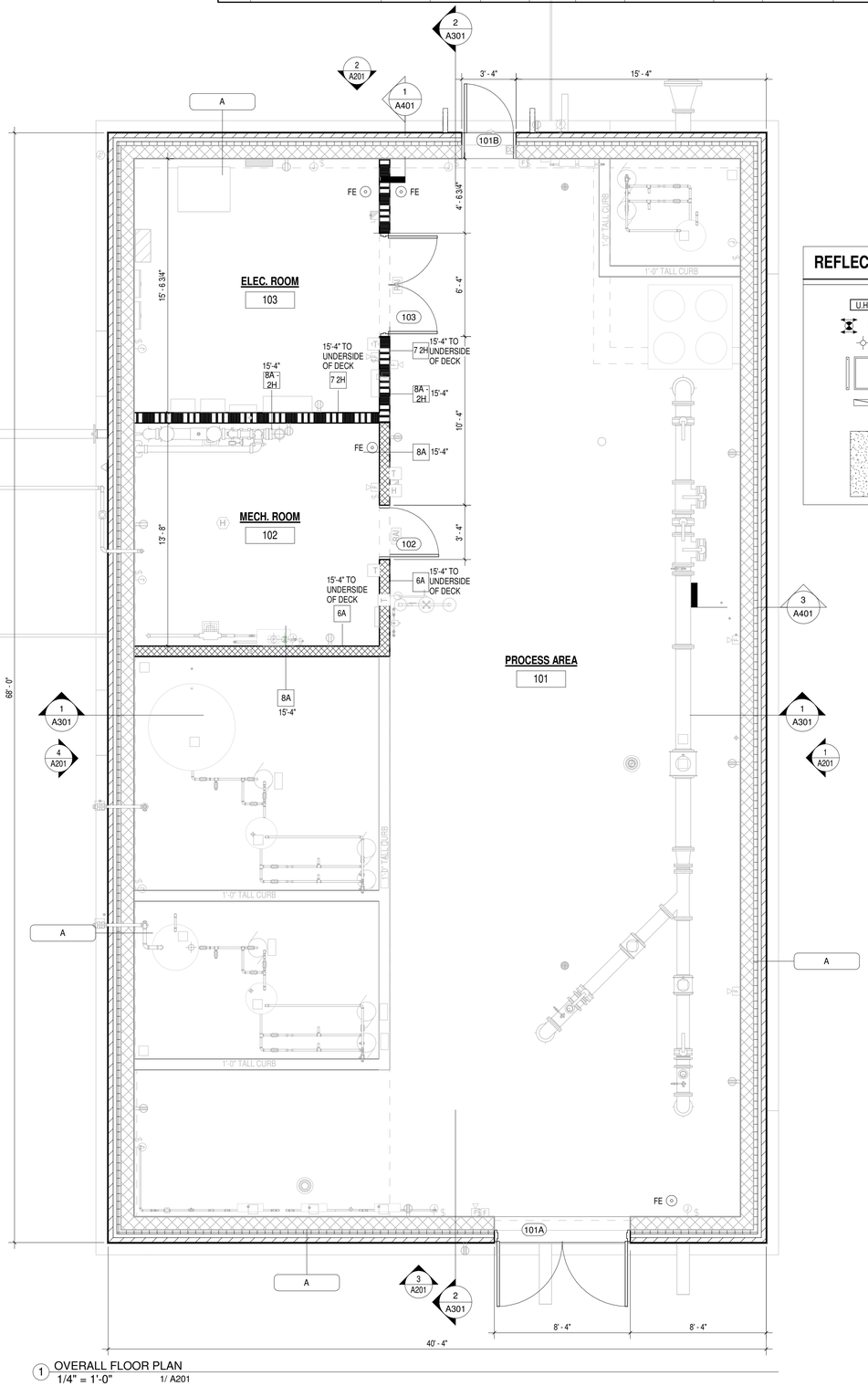
ROOM FINISH SCHEDULE

ROOM #	ROOM NAME	FLOOR MAT	FLOOR FINISH	FLOOR BASE	WALLS MAT	WALLS FINISH	CEILING MAT	CEILING FINISH	CEILING HEIGHT	CEILING TYPE	REMARKS
101	PROCESS AREA	CONCRETE	PNT	CMU	CMU	PNT	OPEN TO STRUCTURE	-	15'-0" - 26'-0" +-	-	Paint Chemical containment curbs appropriately per 09 90 00 - 2.01 A & B
102	MECH. ROOM	CONCRETE	PNT	CMU	CMU	PNT	GYP BOARD	PNT	15'	G3	
103	ELEC. ROOM	CONCRETE	PNT	CMU	CMU	PNT	GYP BOARD	PNT	15'	G3	



2 REFLECTED CEILING PLAN
1/4" = 1'-0" 1/ A201



1 OVERALL FLOOR PLAN
1/4" = 1'-0" 1/ A201

REFLECTED CEILING PLAN LEGEND

- U.H. — UNIT HEATER
- EXIT SIGN
- MOTION DETECTOR
- LIGHT FIXTURES
- SURFACE MTD. LIGHT FIXTURE
- **TYPE G3:** 2-HR FIRE RATED CEILING UL DESIGN NO. U415

FLOOR PLAN GENERAL NOTES:

1. PROCESS SHOWN FOR REFERENCE ONLY. SEE M DRAWINGS FOR MORE INFO.
2. ALL INTERIOR DIMENSIONS ARE TAKEN FROM FACE OF GYPSUM WALL BOARD TO FACE OF GYPSUM WALL BOARD OR FACE OF CMU UNLESS SPECIFICALLY NOTED OTHERWISE.
3. SEE SHEET A021 FOR PLUMBING FIXTURE SCHEDULE / MOUNTING HEIGHTS.

0' 2' 4' 8'
SCALE: 1/4" = 1'-0"

Project:
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Drawing Title:
OVERALL FLOOR & REFLECTED CEILING PLANS

Sheet Number:
A101

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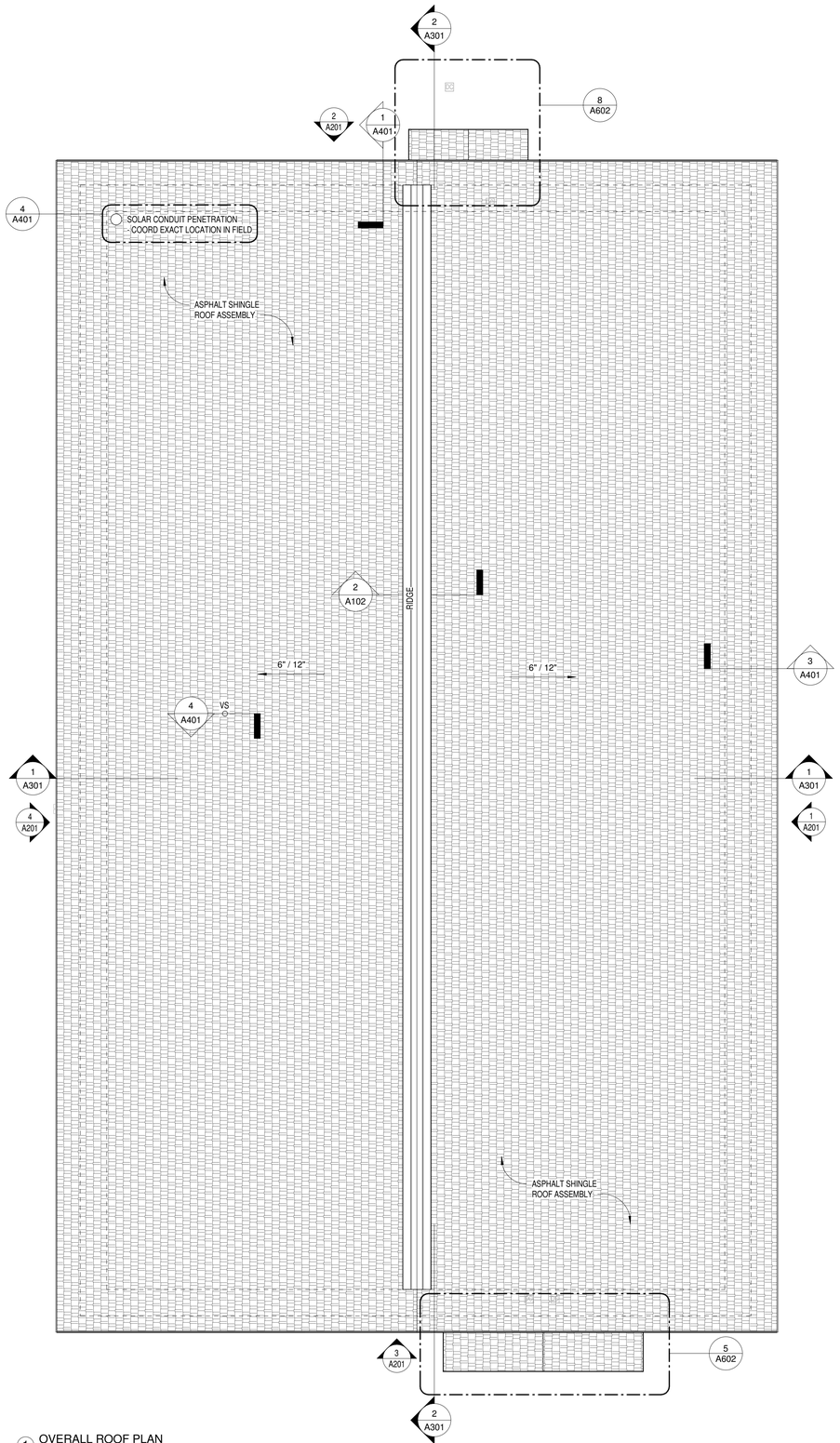
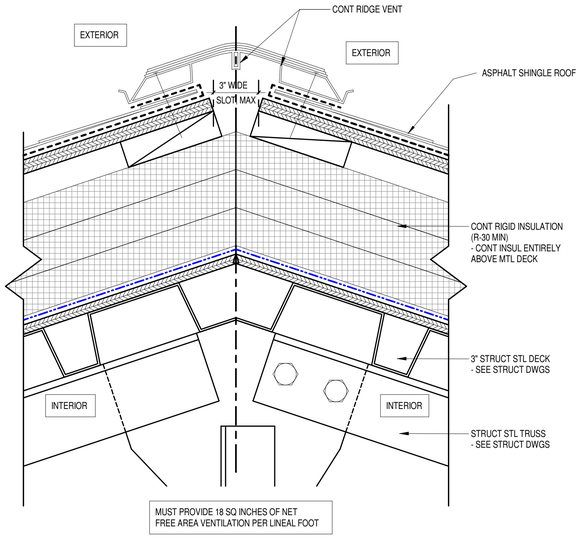


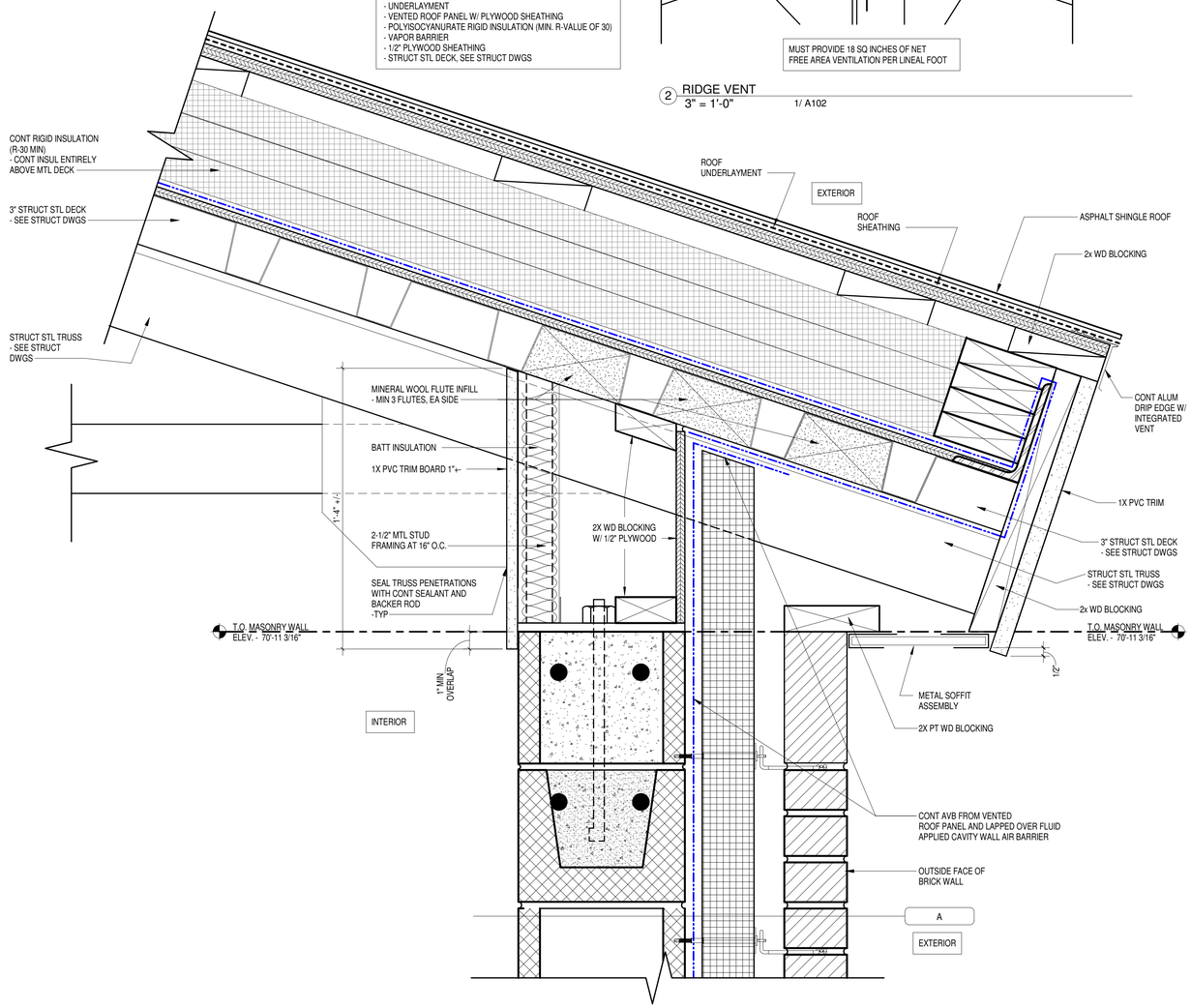
1 OVERALL ROOF PLAN
1/4" = 1'-0" 1/ A201



ASPHALT SHINGLE ROOF SYSTEM
- ASPHALT SHINGLES
- UNDERLAYMENT
- VENTED ROOF PANEL W/ PLYWOOD SHEATHING
- POLYISOCYANURATE RIGID INSULATION (MIN. R-VALUE OF 30)
- VAPOR BARRIER
- 1/2" PLYWOOD SHEATHING
- STRUCT STL DECK, SEE STRUCT DWGS

MUST PROVIDE 18 SQ INCHES OF NET
FREE AREA VENTILATION PER LINEAL FOOT

2 RIDGE VENT
3" = 1'-0" 1/ A102



4 SOFFIT - ASPHALT SHINGLES
3" = 1'-0" 3/ A401

0' 2' 4' 8'
SCALE: 1/4" = 1'-0"

0' 3" 6" 9"
SCALE: 3" = 1'-0"

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W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
OVERALL ROOF PLAN
& DETAILS

Sheet Number:
A102

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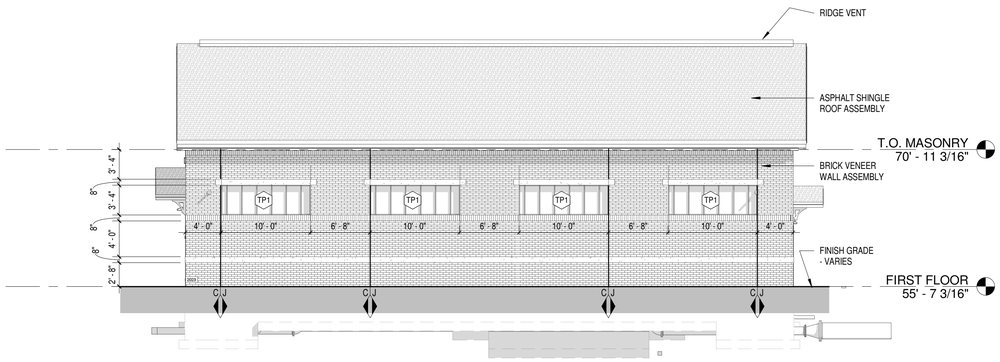
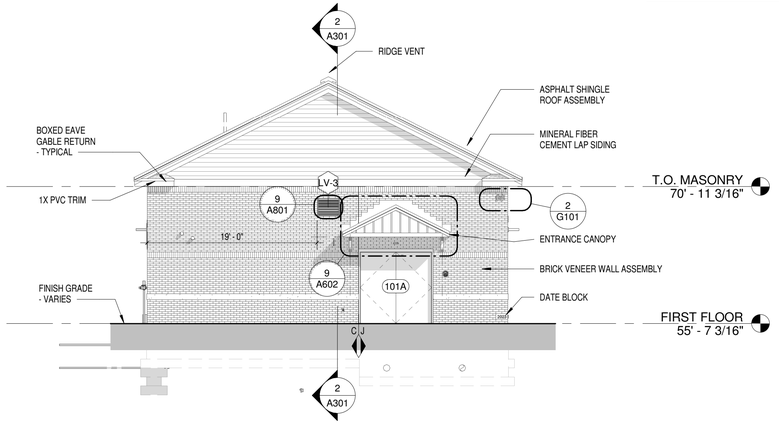
EXTERIOR ELEVATION LEGEND:

CONTROL JOINT LOCATION - REFER TO DETAIL 7 / A601 FOR ADDITIONAL INFO	C J
TYPE 1 - BRICK VENEER BRICK: 2 2/3" x 8" (COMMON SIZE, RUNNING BOND)	
MINERAL FIBER CEMENT LAP / WALL PANEL SIDING	

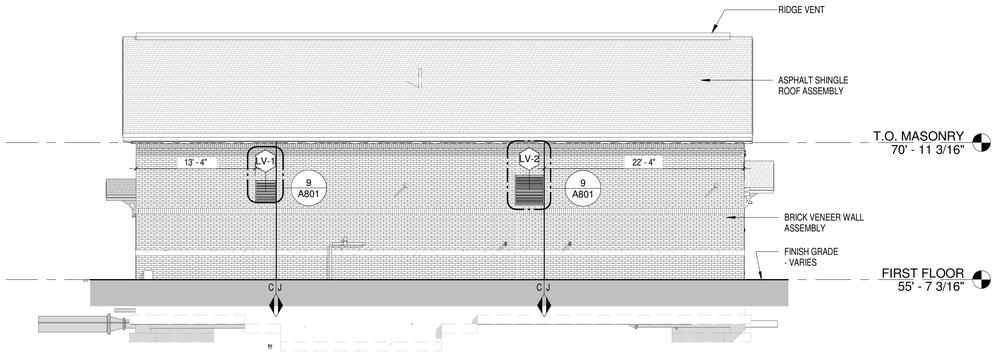
NOTES:
1. COORDINATE OPENINGS NOT SHOWN WITH EQUIPMENT AND MEP/FP DRAWINGS.



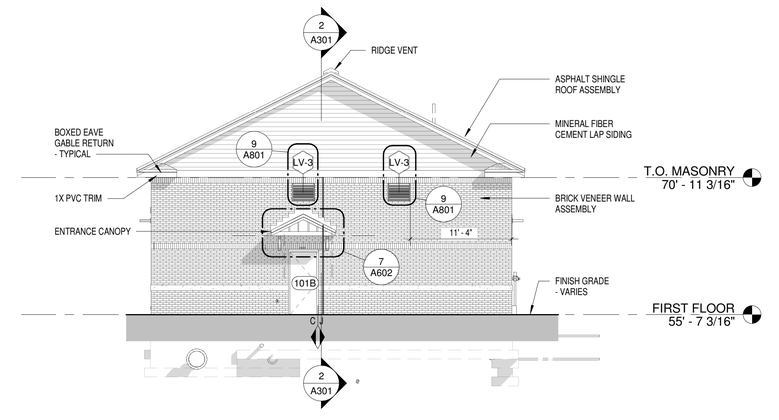
1 EAST EXTERIOR ELEVATION
1/8" = 1'-0" 1/ A101



3 SOUTH EXTERIOR ELEVATION
1/8" = 1'-0" 1/ A101



4 WEST EXTERIOR ELEVATION
1/8" = 1'-0" 1/ A101



2 NORTH EXTERIOR ELEVATION
1/8" = 1'-0" 1/ A101

0' 4' 8' 16'
SCALE: 1/8" = 1'-0"

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OVERALL ELEVATIONS

Sheet Number:
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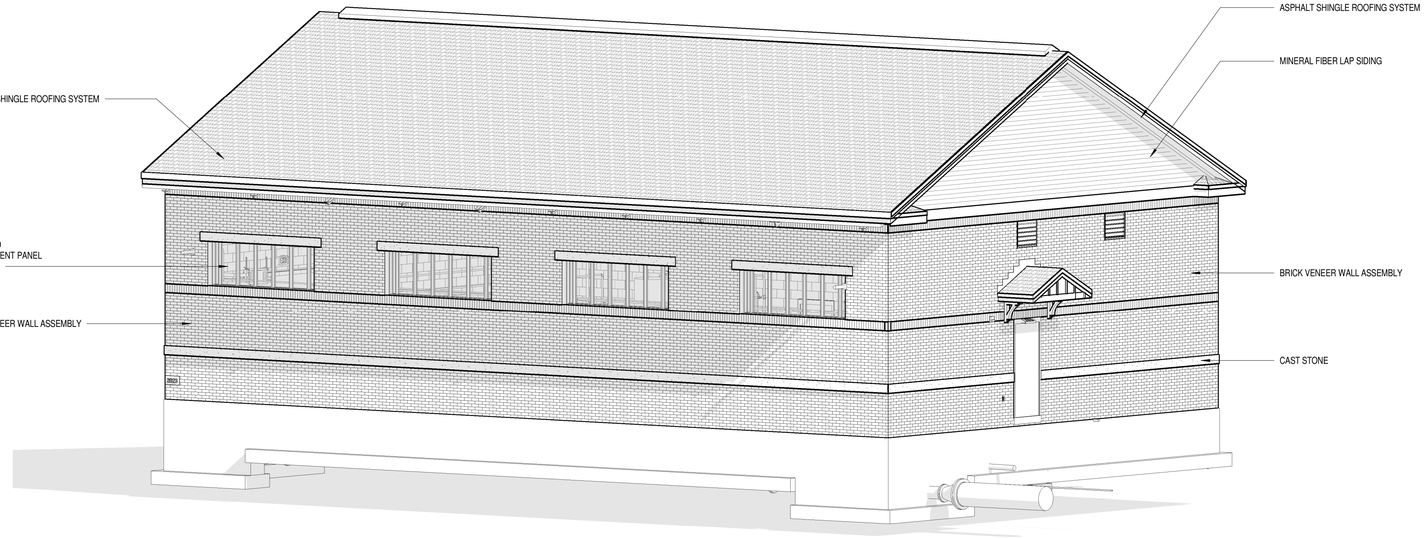
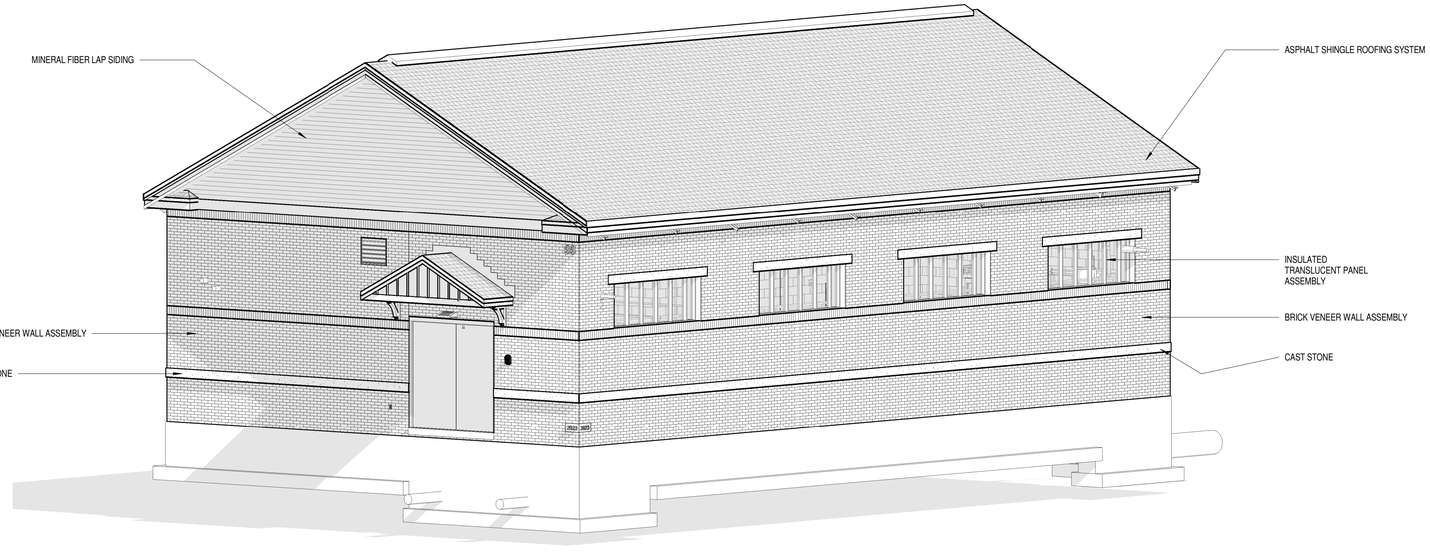


1 3D VIEW



2 3D VIEW

NOTE: 3D VIEWS ARE PROVIDED FOR REFERENCE ONLY. REFER TO PLANS, ELEVATIONS, SECTIONS, DETAILS AND SCHEDULES FOR BUILDING REQUIREMENTS.

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Scale: 1/8" = 1'-0"

Key Plan:

Date:	MARCH 30, 2022
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3D VIEWS

Sheet Number:
A231

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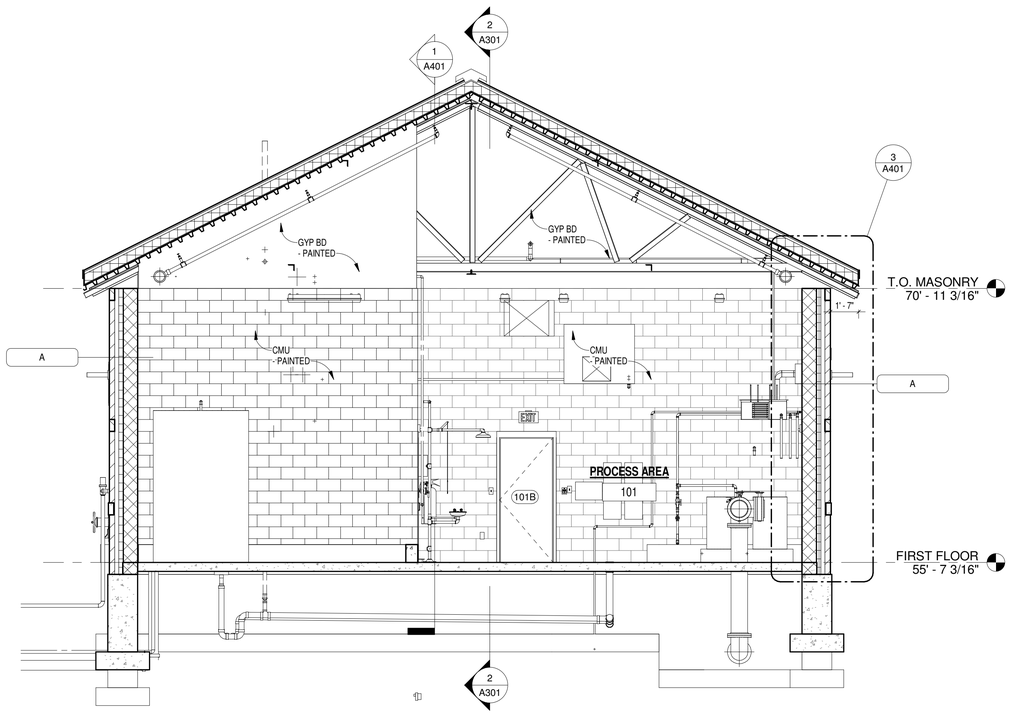
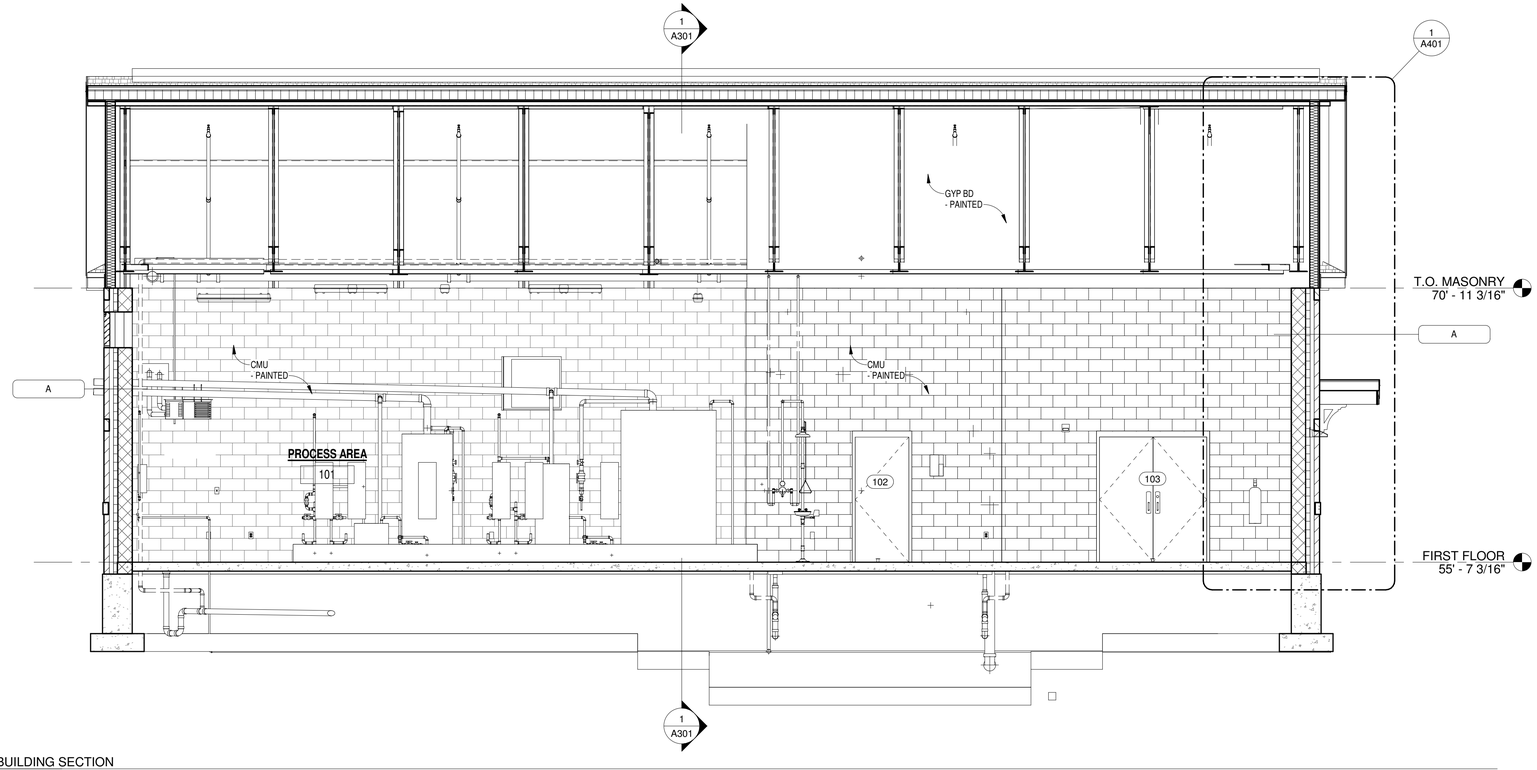


1 BUILDING SECTION
1/4" = 1'-0" 1/ A101



2 BUILDING SECTION
1/4" = 1'-0" 1/ A101

0' 2' 4' 8'
SCALE: 1/4" = 1'-0"

Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD CHATHAM, MA 02633

WELLS 10 AND 11 PUMPING AND TREATMENT DESIGN
MILL HILL ROAD CHATHAM, MA 02633

Weston & Sampson Engineers, Inc.
55 Walkers Brook Drive, Suite 100
Reading, MA 01867
978.532.1900 800.SAMPSON

www.westonandsampson.com

Consultants:

Revisions:

No.	Date	Description

COA:

Seal:
REGISTERED ARCHITECT
DANIEL G. TENNEY III
No. 6688
CAMBRIDGE
MA
COMMONWEALTH OF MASSACHUSETTS

Issued For:
BID

Scale: 1/4" = 1'-0"

Key Plan:

Date:	MARCH 30, 2022
Drawn By:	AF
Reviewed By:	BMc
Approved By:	DGT
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
BUILDING SECTIONS

Sheet Number:
A301

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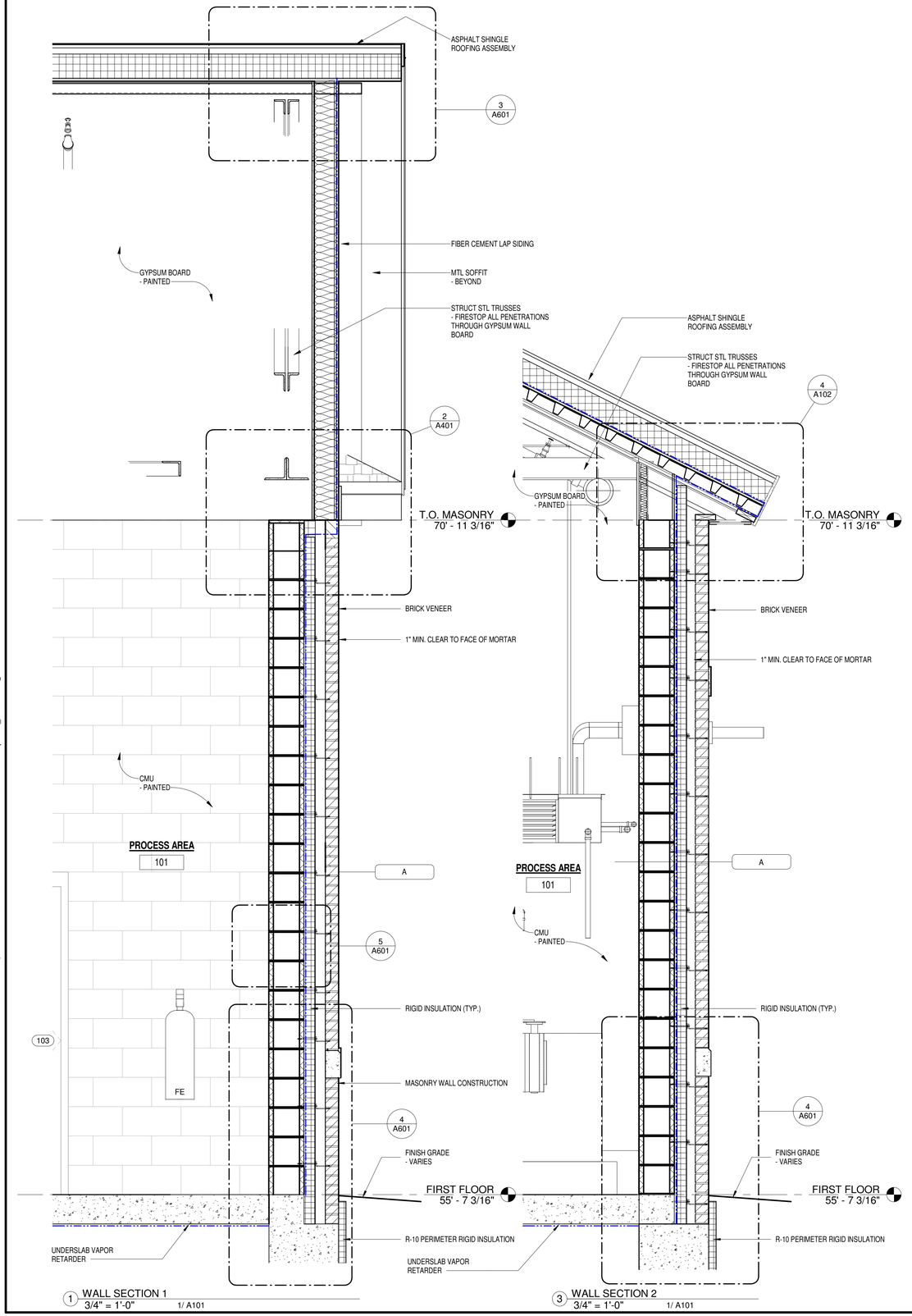
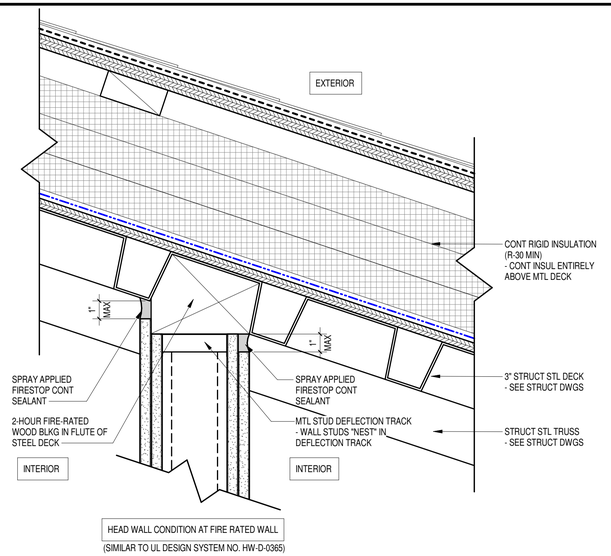
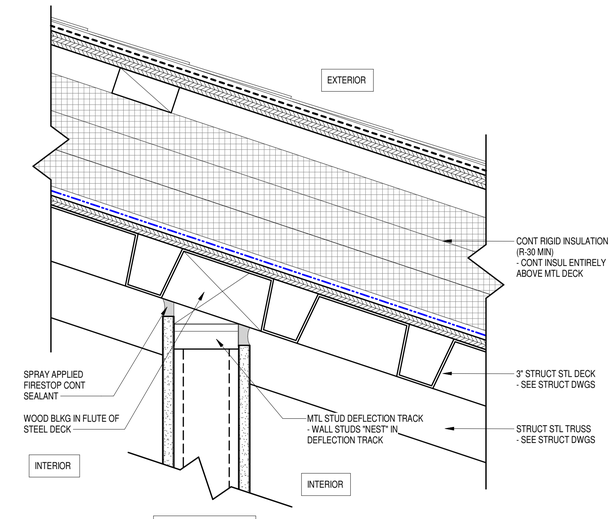


1 WALL SECTION 1
3/4" = 1'-0" 1/ A101

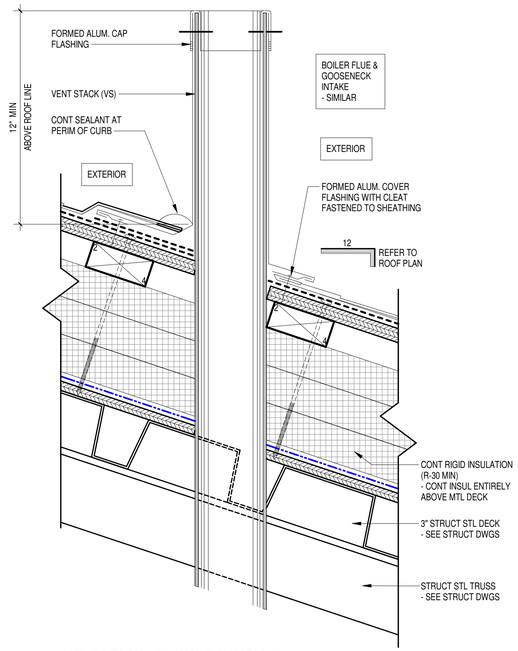
3 WALL SECTION 2
3/4" = 1'-0" 1/ A101


EXTERIOR
CONT RIGID INSULATION (R-30 MIN) - CONT INSUL ENTIRELY ABOVE MTL DECK
1" MAX
SPRAY APPLIED FIRESTOP CONT SEALANT
2-HOUR FIRE-RATED WOOD BLKG IN FLUTE OF STEEL DECK
SPRAY APPLIED FIRESTOP CONT SEALANT
MTL STUD DEFLECTION TRACK - WALL STUDS "NEST" IN DEFLECTION TRACK
3" STRUCT STL DECK - SEE STRUCT DWGS
STRUCT STL TRUSS - SEE STRUCT DWGS
INTERIOR
INTERIOR
HEAD WALL CONDITION AT FIRE RATED WALL
(SIMILAR TO UL DESIGN SYSTEM NO. HW-D-0365)

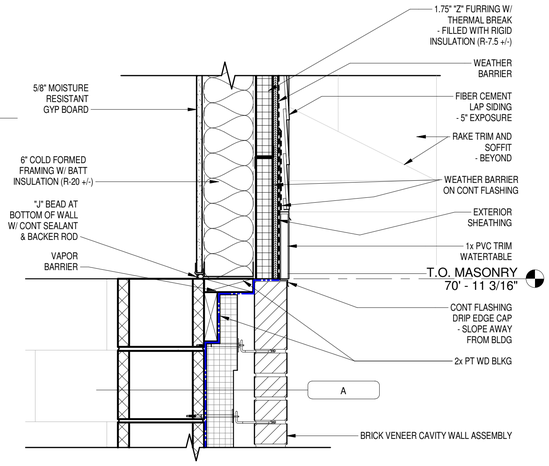
5 VENTED ROOF PANEL - TOP OF WALL, RATED
3" = 1'-0" 2/ A101


EXTERIOR
CONT RIGID INSULATION (R-30 MIN) - CONT INSUL ENTIRELY ABOVE MTL DECK
SPRAY APPLIED FIRESTOP CONT SEALANT
WOOD BLKG IN FLUTE OF STEEL DECK
3" STRUCT STL DECK - SEE STRUCT DWGS
MTL STUD DEFLECTION TRACK - WALL STUDS "NEST" IN DEFLECTION TRACK
STRUCT STL TRUSS - SEE STRUCT DWGS
INTERIOR
INTERIOR
HEAD WALL CONDITION

6 VENTED ROOF PANEL - TOP OF WALL, NON RATED
3" = 1'-0" 2/ A101


FORMED ALUM. CAP FLASHING
12" MIN ABOVE ROOF LINE
VENT STACK (VS)
CONT SEALANT AT PERIM OF CURB
EXTERIOR
EXTERIOR
BOILER FLUE & GOOSENECK INTAKE - SIMILAR
FORMED ALUM. COVER FLASHING WITH CLEAT FASTENED TO SHEATHING
12
REFER TO ROOF PLAN
CONT RIGID INSULATION (R-30 MIN) - CONT INSUL ENTIRELY ABOVE MTL DECK
3" STRUCT STL DECK - SEE STRUCT DWGS
STRUCT STL TRUSS - SEE STRUCT DWGS

4 VENT STACK - ASPHALT SHINGLES
3" = 1'-0" 1/ A102


1.75" "Z" FURRING W/ THERMAL BREAK - FILLED WITH RIGID INSULATION (R-7.5 +/-)
WEATHER BARRIER
5/8" MOISTURE RESISTANT GYP BOARD
FIBER CEMENT LAP SIDING - 5" EXPOSURE
RAKE TRIM AND SOFFIT - BEYOND
6" COLD FORMED FRAMING W/ BATT INSULATION (R-20 +/-)
WEATHER BARRIER ON CONT FLASHING
"J" BEAD AT BOTTOM OF WALL W/ CONT SEALANT & BACKER ROD
EXTERIOR SHEATHING
1x PVC TRIM WATERTABLE
VAPOR BARRIER
T.O. MASONRY 70' - 11 3/16"
CONT FLASHING DRIP EDGE CAP - SLOPE AWAY FROM BLDG
2x PT WD BLKG
A
BRICK VENEER CAVITY WALL ASSEMBLY

2 FIBER CEMENT TO CMU TRANSITION DETAIL
1 1/2" = 1'-0" 1/ A401

0' 1' 2' 3'
SCALE: 3/4" = 1'-0"

0' 6" 1' 2'
SCALE: 1 1/2" = 1'-0"

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Reviewed By:	BMc
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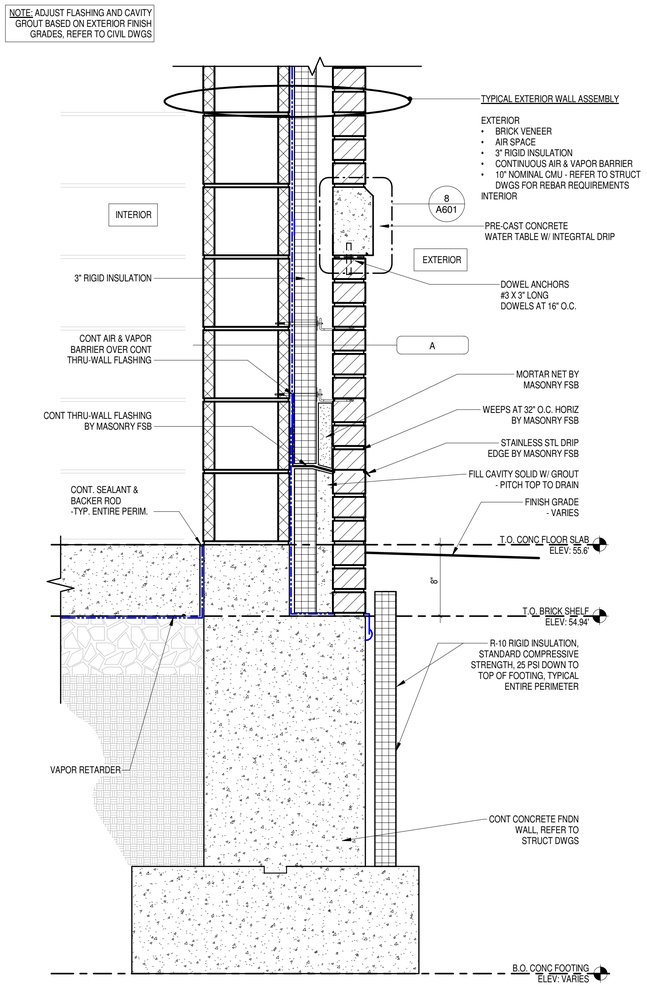
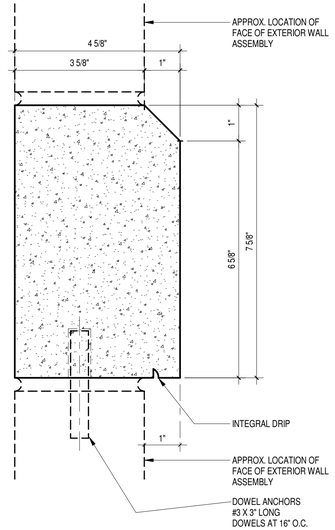
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
WALL SECTIONS

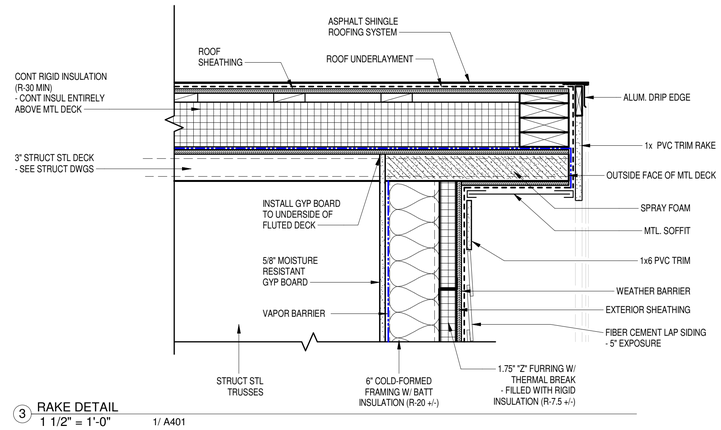
Sheet Number:
A401


NOTE: ADJUST FLASHING AND CAVITY GROUT BASED ON EXTERIOR FINISH GRADES, REFER TO CIVIL DWGS
TYPICAL EXTERIOR WALL ASSEMBLY
EXTERIOR
• BRICK VENEER
• AIR SPACE
• 3" RIGID INSULATION
• CONTINUOUS AIR & VAPOR BARRIER
• 10" NOMINAL CMU - REFER TO STRUCT DWGS FOR REBAR REQUIREMENTS
INTERIOR
INTERIOR
8
A601
PRE-CAST CONCRETE WATER TABLE W/ INTEGRTAL DRIP
EXTERIOR
3" RIGID INSULATION
DOWEL ANCHORS #3 X 3" LONG DOWELS AT 16" O.C.
A
CONT AIR & VAPOR BARRIER OVER CONT THRU-WALL FLASHING
MORTAR NET BY MASONRY FSB
CONT THRU-WALL FLASHING BY MASONRY FSB
WEEPS AT 32" O.C. HORIZ BY MASONRY FSB
STAINLESS STL DRIP EDGE BY MASONRY FSB
FILL CAVITY SOLID W/ GROUT - PITCH TOP TO DRAIN
CONT. SEALANT & BACKER ROD -TYP. ENTIRE PERIM.
FINISH GRADE - VARIES
T.O. CONC FLOOR SLAB ELEV: 55.0'
8"
T.O. BRICK SHELF ELEV: 54.94'
R-10 RIGID INSULATION, STANDARD COMPRESSIVE STRENGTH, 25 PSI DOWN TO TOP OF FOOTING, TYPICAL ENTIRE PERIMETER
VAPOR RETARDER
CONT CONCRETE FNDN WALL, REFER TO STRUCT DWGS
B.O. CONC FOOTING ELEV: VARIES

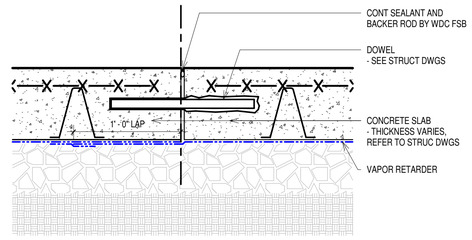
4 BASE OF WALL DETAIL - TYPICAL
1 1/2" = 1'-0" 1/ A401



8 PRE-CAST CONCRETE SILL
6" = 1'-0" 4/ A601


ASPHALT SHINGLE ROOFING SYSTEM
ROOF SHEATHING
ROOF UNDERLAYMENT
CONT RIGID INSULATION (R-30 MIN) - CONT INSUL ENTIRELY ABOVE MTL DECK
ALUM. DRIP EDGE
1x PVC TRIM RAKE
3" STRUCT STL DECK - SEE STRUCT DWGS
OUTSIDE FACE OF MTL DECK
INSTALL GYP BOARD TO UNDERSIDE OF FLUTED DECK
SPRAY FOAM
MTL. SOFFIT
5/8" MOISTURE RESISTANT GYP BOARD
1x6 PVC TRIM
WEATHER BARRIER
VAPOR BARRIER
EXTERIOR SHEATHING
FIBER CEMENT LAP SIDING - 5" EXPOSURE
STRUCT STL TRUSSES
6" COLD-FORMED FRAMING W/ BATT INSULATION (R-20 +/-)
1.75" "Z" FURRING W/ THERMAL BREAK - FILLED WITH RIGID INSULATION (R-7.5 +/-)

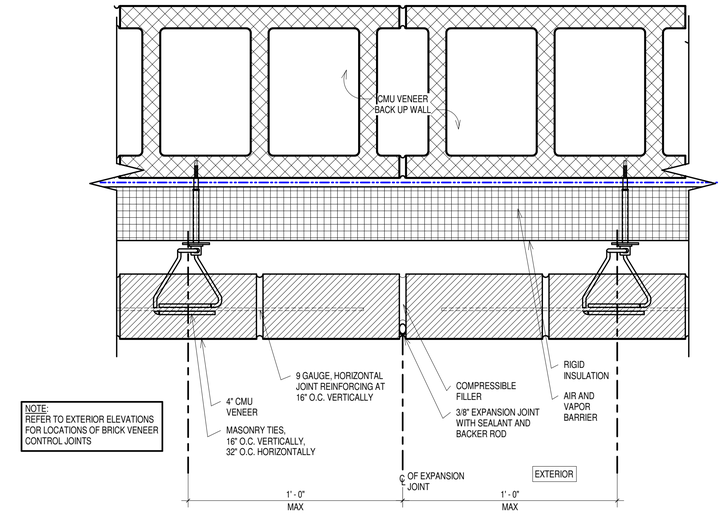
3 RAKE DETAIL
1 1/2" = 1'-0" 1/ A401


CONT SEALANT AND BACKER ROD BY WDC FSB
DOWEL - SEE STRUCT DWGS
1'-0" LAP
CONCRETE SLAB - THICKNESS VARIES, REFER TO STRUC DWGS
VAPOR RETARDER

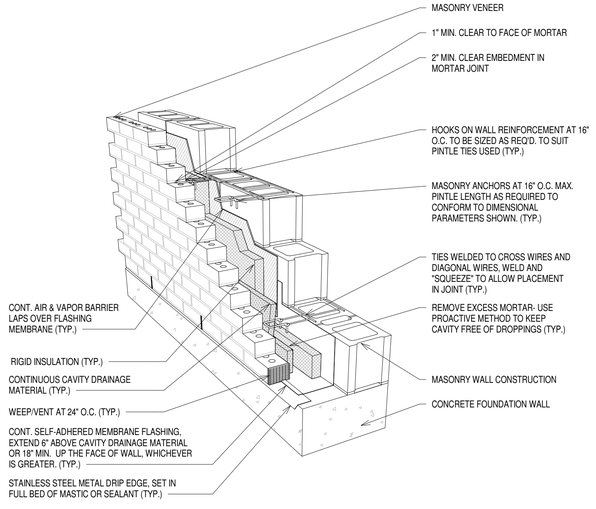
1 VAPOR RETARDER LAPPED JOINT
1 1/2" = 1'-0"

SLOT SHALL ALLOW FOR MAX. 1/16" MOVEMENT, PERPENDICULAR TO THE PLANE OF THE WALL
VENEER ANCHOR LENGTH AS REQUIRED TO CONFORM TO DIMENSIONAL PARAMETERS SHOWN.
BRICK VENEER
9 GAUGE, HORIZONTAL JOINT REINFORCING AT 16" O.C. VERTICALLY
AIR SPACE
MASONRY TIES, 16" O.C. VERTICALLY, 32" O.C. HORIZONTALLY
AIR AND VAPOR BARRIER
CMU BACK-UP WALL
3" RIGID INSULATION

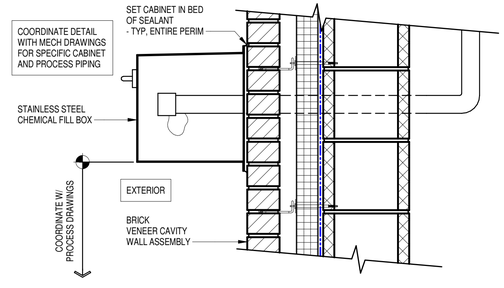
5 EXTERIOR WALL DETAIL - BRICK
3" = 1'-0" 1/ A401


CMU VENEER BACK UP WALL
9 GAUGE, HORIZONTAL JOINT REINFORCING AT 16" O.C. VERTICALLY
4" CMU VENEER
MASONRY TIES, 16" O.C. VERTICALLY, 32" O.C. HORIZONTALLY
COMPRESSIBLE FILLER
3/8" EXPANSION JOINT WITH SEALANT AND BACKER ROD
RIGID INSULATION
AIR AND VAPOR BARRIER
NOTE: REFER TO EXTERIOR ELEVATIONS FOR LOCATIONS OF BRICK VENEER CONTROL JOINTS
℄ OF EXPANSION JOINT
EXTERIOR
1' - 0" MAX
1' - 0" MAX

7 EXTERIOR WALL DETAIL - BRICK CONTROL JOINT
3" = 1'-0"


MASONRY VENEER
1" MIN. CLEAR TO FACE OF MORTAR
2" MIN. CLEAR EMBEDMENT IN MORTAR JOINT
HOOKS ON WALL REINFORCEMENT AT 16" O.C. TO BE SIZED AS REQ'D. TO SUIT PINTLE TIES USED (TYP.)
MASONRY ANCHORS AT 16" O.C. MAX. PINTLE LENGTH AS REQUIRED TO CONFORM TO DIMENSIONAL PARAMETERS SHOWN. (TYP.)
TIES WELDED TO CROSS WIRES AND DIAGONAL WIRES, WELD AND "SQUEEZE" TO ALLOW PLACEMENT IN JOINT (TYP.)
CONT. AIR & VAPOR BARRIER LAPS OVER FLASHING MEMBRANE (TYP.)
REMOVE EXCESS MORTAR- USE PROACTIVE METHOD TO KEEP CAVITY FREE OF DROPPINGS (TYP.)
RIGID INSULATION (TYP.)
CONTINUOUS CAVITY DRAINAGE MATERIAL (TYP.)
MASONRY WALL CONSTRUCTION
WEEP/VENT AT 24" O.C. (TYP.)
CONCRETE FOUNDATION WALL
CONT. SELF-ADHERED MEMBRANE FLASHING, EXTEND 6" ABOVE CAVITY DRAINAGE MATERIAL OR 18" MIN. UP THE FACE OF WALL, WHICHEVER IS GREATER. (TYP.)
STAINLESS STEEL METAL DRIP EDGE, SET IN FULL BED OF MASTIC OR SEALANT (TYP.)

6 FLASHING AXON
1/2" = 1'-0"


COORDINATE DETAIL WITH MECH DRAWINGS FOR SPECIFIC CABINET AND PROCESS PIPING
SET CABINET IN BED OF SEALANT - TYP. ENTIRE PERIM
STAINLESS STEEL CHEMICAL FILL BOX
EXTERIOR
COORDINATE W/ PROCESS DRAWINGS
BRICK VENEER CAVITY WALL ASSEMBLY

2 EXTERIOR CHEMICAL FILL BOX
1 1/2" = 1'-0"

0' 6" 1' 2'
SCALE: 1 1/2" = 1'-0"

0' 3" 6" 9"
SCALE: 3" = 1'-0"

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CHATHAM WATER & SEWER DIVISION
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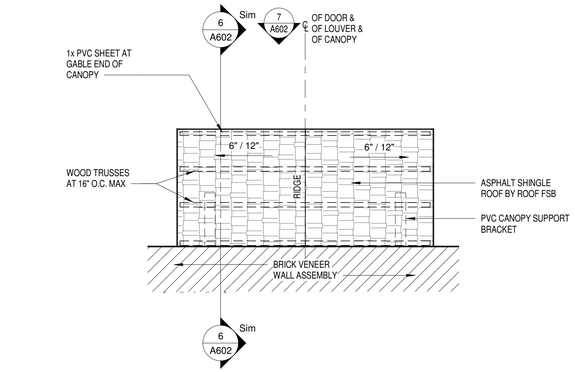
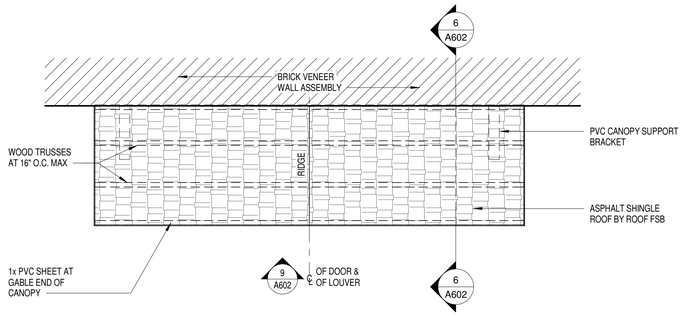
Drawing Title:
DETAILS

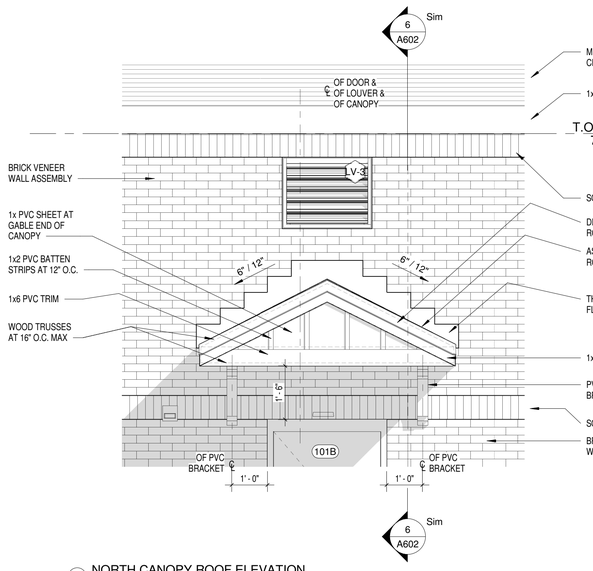
Sheet Number:
A601



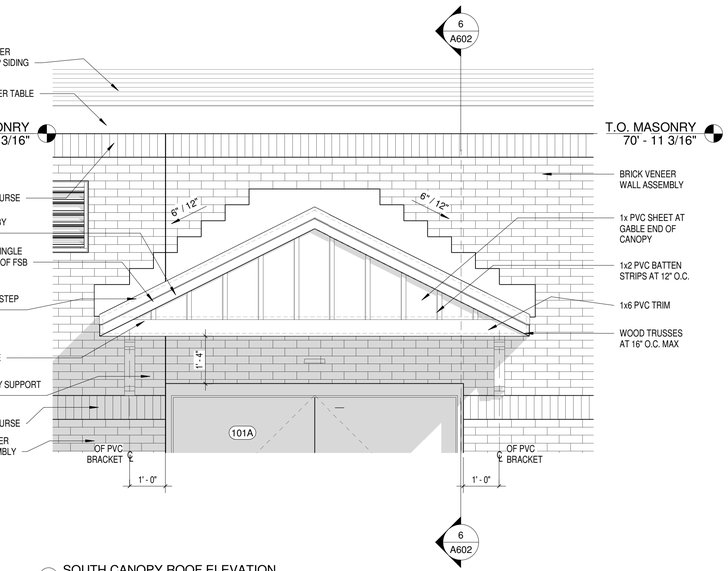
8 NORTH CANOPY ROOF PLAN
1/2" = 1'-0" 1/ A102


6 A602
BRICK VENEER WALL ASSEMBLY
RIDGE
WOOD TRUSSES AT 16" O.C. MAX
PVC CANOPY SUPPORT BRACKET
ASPHALT SHINGLE ROOF BY ROOF FSB
1x PVC SHEET AT GABLE END OF CANOPY
9 A602
℄ OF DOOR & ℄ OF LOUVER
6 A602

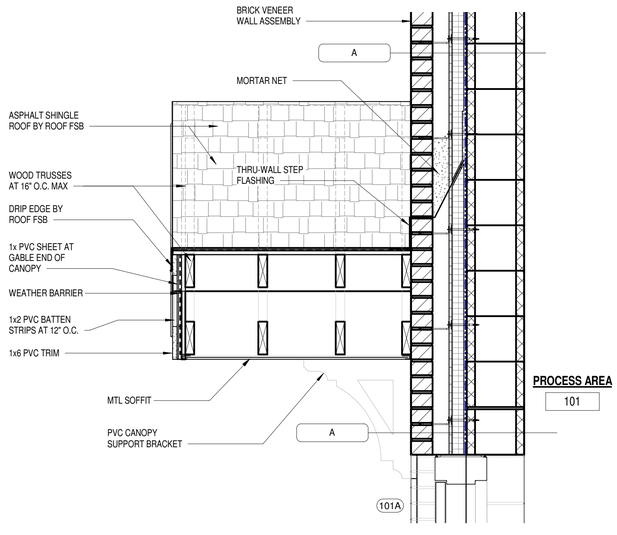
5 SOUTH CANOPY ROOF PLAN
1/2" = 1'-0" 1/ A102



7 NORTH CANOPY ROOF ELEVATION
1/2" = 1'-0" 2/ A201



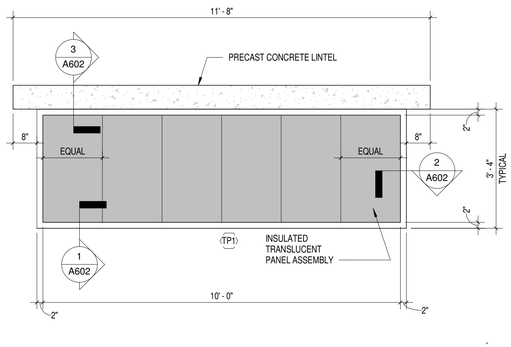
9 SOUTH CANOPY ROOF ELEVATION
1/2" = 1'-0" 3/ A201



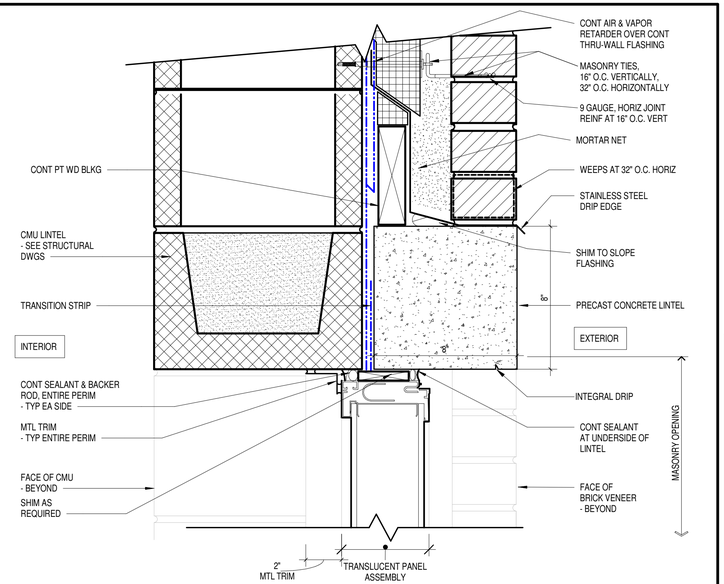
6 CANOPY SECTION - TYPICAL
1" = 1'-0" 5/ A602

INSULATED TRANSLUCENT PANEL ASSEMBLY SCHEDULE

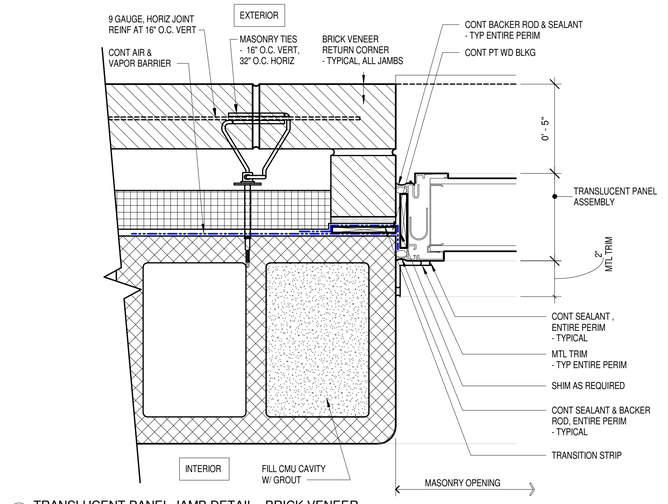
TYPE	WIDTH	HEIGHT	COUNT	HT. AFF (1ST FLR)	COMMENTS
TP1	10' - 0"	4'-0"	4	8' - 0"	



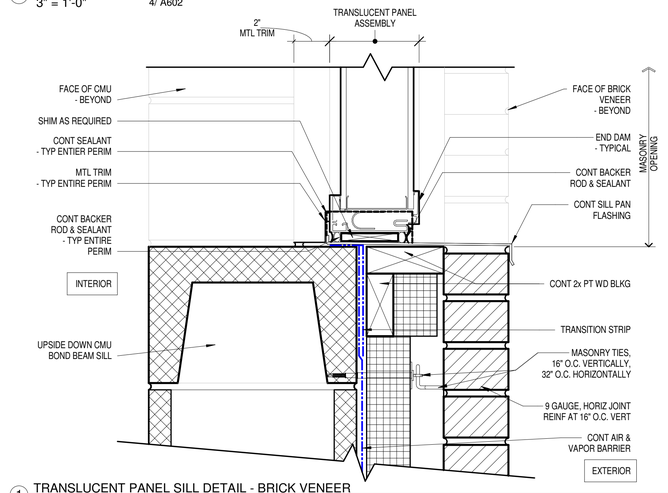
4 TRANSLUCENT PANEL ELEVATION
1/2" = 1'-0"


CONT AIR & VAPOR RETARDER OVER CONT THRU-WALL FLASHING
MASONRY TIES, 16" O.C. VERTICALLY, 32" O.C. HORIZONTALLY
9 GAUGE, HORIZ JOINT REINF AT 16" O.C. VERT
MORTAR NET
WEEPS AT 32" O.C. HORIZ
STAINLESS STEEL DRIP EDGE
CONT PT WD BLKG
CMU LINTEL - SEE STRUCTURAL DWGS
SHIM TO SLOPE FLASHING
TRANSITION STRIP
8"
PRECAST CONCRETE LINTEL
INTERIOR
EXTERIOR
8"
CONT SEALANT & BACKER ROD, ENTIRE PERIM - TYP EA SIDE
INTEGRAL DRIP
MTL TRIM - TYP ENTIRE PERIM
CONT SEALANT AT UNDERSIDE OF LINTEL
FACE OF CMU - BEYOND
FACE OF BRICK VENEER - BEYOND
SHIM AS REQUIRED
MASONRY OPENING
2" MTL TRIM
TRANSLUCENT PANEL ASSEMBLY

3 TRANSLUCENT PANEL HEAD DETAIL - BRICK VENEER
3" = 1'-0" 4/ A602


9 GAUGE, HORIZ JOINT REINF AT 16" O.C. VERT
EXTERIOR
CONT AIR & VAPOR BARRIER
MASONRY TIES - 16" O.C. VERT, 32" O.C. HORIZ
BRICK VENEER RETURN CORNER - TYPICAL, ALL JAMBS
CONT BACKER ROD & SEALANT - TYP ENTIRE PERIM
CONT PT WD BLKG
0' - 5"
TRANSLUCENT PANEL ASSEMBLY
2" MTL TRIM
CONT SEALANT , ENTIRE PERIM - TYPICAL
MTL TRIM - TYP ENTIRE PERIM
SHIM AS REQUIRED
CONT SEALANT & BACKER ROD, ENTIRE PERIM - TYPICAL
TRANSITION STRIP
INTERIOR
FILL CMU CAVITY W/ GROUT
MASONRY OPENING

2 TRANSLUCENT PANEL JAMB DETAIL - BRICK VENEER
3" = 1'-0" 4/ A602


TRANSLUCENT PANEL ASSEMBLY
2" MTL TRIM
FACE OF CMU - BEYOND
FACE OF BRICK VENEER - BEYOND
SHIM AS REQUIRED
END DAM - TYPICAL
CONT SEALANT - TYP ENTIER PERIM
CONT BACKER ROD & SEALANT
MTL TRIM - TYP ENTIRE PERIM
CONT SILL PAN FLASHING
MASONRY OPENING
CONT BACKER ROD & SEALANT - TYP ENTIRE PERIM
INTERIOR
CONT 2x PT WD BLKG
TRANSITION STRIP
UPSIDE DOWN CMU BOND BEAM SILL
MASONRY TIES, 16" O.C. VERTICALLY, 32" O.C. HORIZONTALLY
9 GAUGE, HORIZ JOINT REINF AT 16" O.C. VERT
CONT AIR & VAPOR BARRIER
EXTERIOR

1 TRANSLUCENT PANEL SILL DETAIL - BRICK VENEER
3" = 1'-0" 4/ A602

Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD CHATHAM, MA 02633

WELLS 10 AND 11 PUMPING AND TREATMENT DESIGN
MILL HILL ROAD CHATHAM, MA 02633

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Consultants:

Revisions:

No.	Date	Description

COA:

Seal:
REGISTERED ARCHITECT DANIEL G. TENNEY No. 6688 CAMBRIDGE MA COMMONWEALTH OF MASSACHUSETTS

Issued For:
BID

Scale: As indicated

Key Plan:

Date:	MARCH 30, 2022
Drawn By:	AF
Reviewed By:	BMc
Approved By:	JC
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
DETAILS

Sheet Number:
A602

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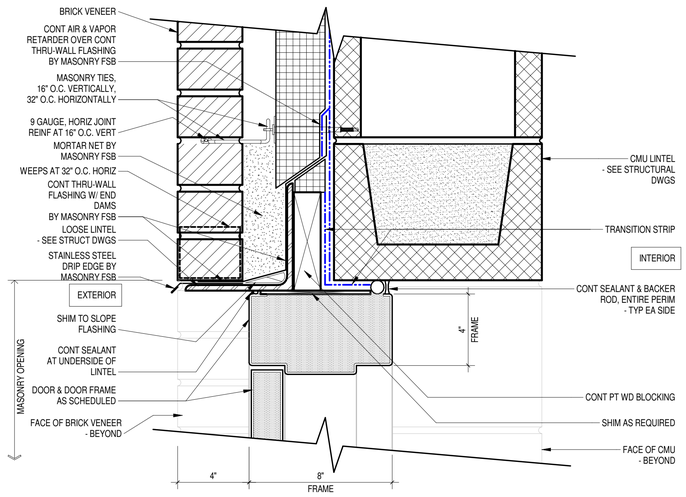
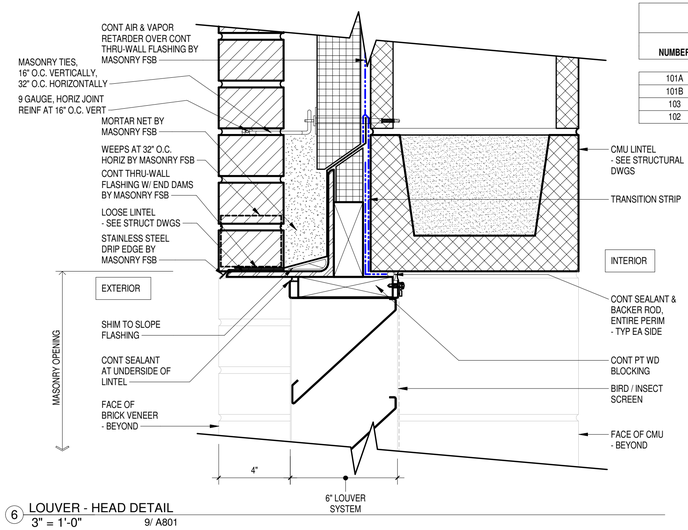

BRICK VENEER
CONT AIR & VAPOR RETARDER OVER CONT THRU-WALL FLASHING BY MASONRY FSB
MASONRY TIES, 16" O.C. VERTICALLY, 32" O.C. HORIZONTALLY
9 GAUGE, HORIZ JOINT REINF AT 16" O.C. VERT
MORTAR NET BY MASONRY FSB
WEEPS AT 32" O.C. HORIZ
CONT THRU-WALL FLASHING W/ END DAMS BY MASONRY FSB
LOOSE LINTEL - SEE STRUCT DWGS
STAINLESS STEEL DRIP EDGE BY MASONRY FSB
EXTERIOR
SHIM TO SLOPE FLASHING
CONT SEALANT AT UNDERSIDE OF LINTEL
DOOR & DOOR FRAME AS SCHEDULED
FACE OF BRICK VENEER - BEYOND
MASONRY OPENING
CMU LINTEL - SEE STRUCTURAL DWGS
TRANSITION STRIP
INTERIOR
CONT SEALANT & BACKER ROD, ENTIRE PERIM - TYP EA SIDE
4"
FRAME
CONT PT WD BLOCKING
SHIM AS REQUIRED
FACE OF CMU - BEYOND
4"
8"
FRAME

1 EXTERIOR DOOR - HEAD DETAIL
3" = 1'-0"


CONT AIR & VAPOR RETARDER OVER CONT THRU-WALL FLASHING BY MASONRY FSB
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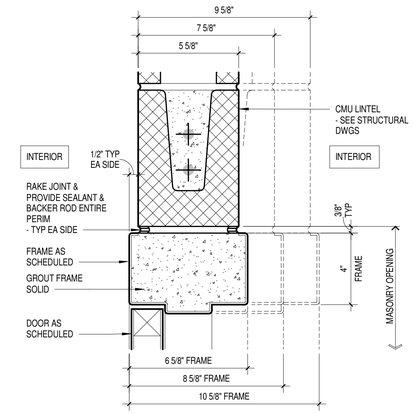
LOOSE LINTEL - SEE STRUCT DWGS
STAINLESS STEEL DRIP EDGE BY MASONRY FSB
EXTERIOR
SHIM TO SLOPE FLASHING
CONT SEALANT AT UNDERSIDE OF LINTEL
FACE OF BRICK VENEER - BEYOND
MASONRY OPENING
CMU LINTEL - SEE STRUCTURAL DWGS
TRANSITION STRIP
INTERIOR
CONT SEALANT & BACKER ROD, ENTIRE PERIM - TYP EA SIDE
CONT PT WD BLOCKING
BIRD / INSECT SCREEN
FACE OF CMU - BEYOND
4"
6" LOUVER SYSTEM

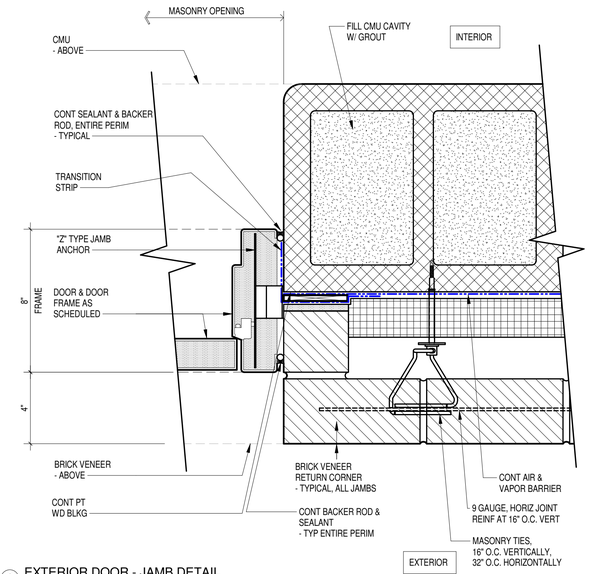
6 LOUVER - HEAD DETAIL
3" = 1'-0" 9/ A801

DOOR SCHEDULE

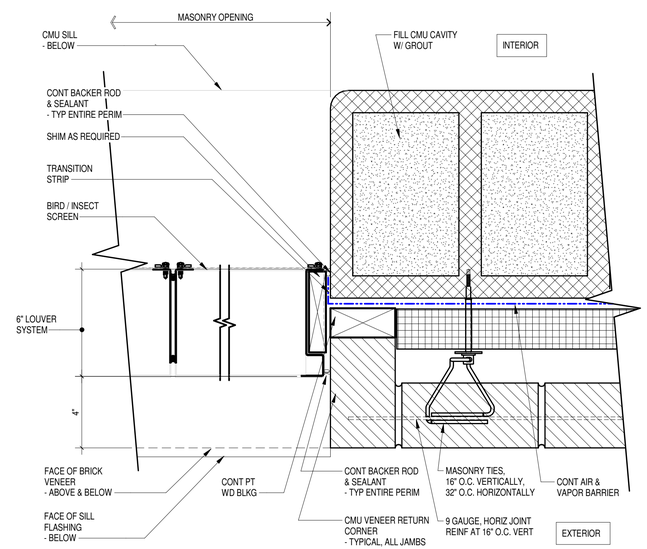
NUMBER	DOOR WIDTH	DOOR HEIGHT	DOOR TYPE	DOOR MATERIAL	FRAMES TYPE	FRAMES MATERIAL	DETAILS HEAD	DETAILS JAMB	DETAILS SILL	RATING	HDWR SET	DOOR CONTACT	REMARKS
101A	8' - 0"	8' - 0"	FG-1	FIBERGLASS	FGF-1	FIBERGLASS	1/A801	2/A801	5/A801	-	1	•	
101B	3' - 0"	7' - 0"	FG-1	FIBERGLASS	FGF-1	FIBERGLASS	1/A801	2/A801	5/A801	-	2	•	
103	6' - 0"	7' - 0"	FG-1	FIBERGLASS	FGF-1	FIBERGLASS	3/A801	4/A801		2-HR	3		
102	3' - 0"	7' - 0"	FG-1	FIBERGLASS	FGF-1	FIBERGLASS	3/A801	4/A801		-	4		



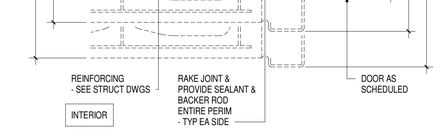
3 CMU DOOR HEAD DETAIL
3" = 1'-0"


MASONRY OPENING
FILL CMU CAVITY W/ GROUT
INTERIOR
CMU - ABOVE
CONT SEALANT & BACKER ROD, ENTIRE PERIM - TYPICAL
TRANSITION STRIP
"Z" TYPE JAMB ANCHOR
8" FRAME
DOOR & DOOR FRAME AS SCHEDULED
4"
BRICK VENEER - ABOVE
CONT PT WD BLKG
BRICK VENEER RETURN CORNER - TYPICAL, ALL JAMBS
CONT BACKER ROD & SEALANT - TYP ENTIRE PERIM
CONT AIR & VAPOR BARRIER
9 GAUGE, HORIZ JOINT REINF AT 16" O.C. VERT
MASONRY TIES, 16" O.C. VERTICALLY, 32" O.C. HORIZONTALLY
EXTERIOR

2 EXTERIOR DOOR - JAMB DETAIL
3" = 1'-0"


MASONRY OPENING
CMU SILL - BELOW
FILL CMU CAVITY W/ GROUT
INTERIOR
CONT BACKER ROD & SEALANT - TYP ENTIRE PERIM
SHIM AS REQUIRED
TRANSITION STRIP
BIRD / INSECT SCREEN
6" LOUVER SYSTEM
4"
FACE OF BRICK VENEER - ABOVE & BELOW
FACE OF SILL FLASHING - BELOW
CONT PT WD BLKG
CONT BACKER ROD & SEALANT - TYP ENTIRE PERIM
CMU VENEER RETURN CORNER - TYPICAL, ALL JAMBS
MASONRY TIES, 16" O.C. VERTICALLY, 32" O.C. HORIZONTALLY
9 GAUGE, HORIZ JOINT REINF AT 16" O.C. VERT
CONT AIR & VAPOR BARRIER
EXTERIOR

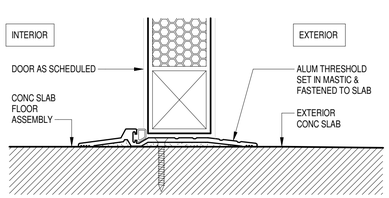
8 LOUVER - JAMB DETAIL
3" = 1'-0" 9/ A801



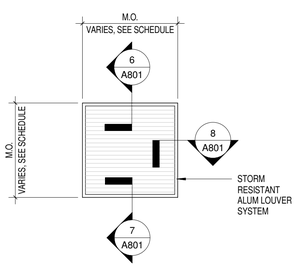
4 CMU DOOR JAMB DETAIL
3" = 1'-0"

LOUVER SCHEDULE

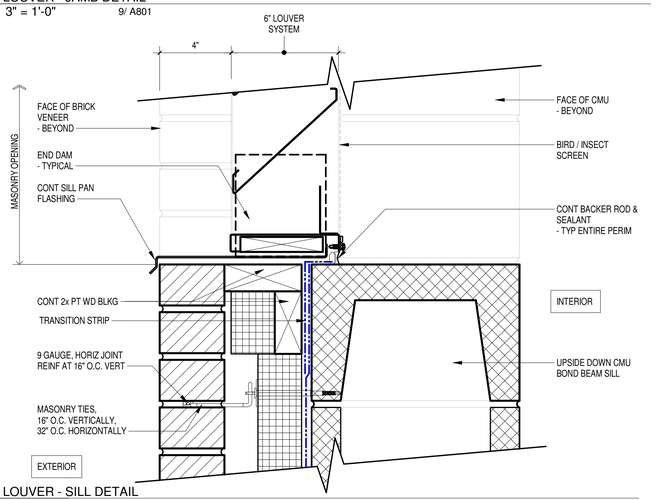
TYPE	WIDTH	HEIGHT	COUNT	HEIGHT A.F.F.	COMMENTS
LV-1	2' - 4"	2' - 4"	1	8' - 9"	
LV-2	3' - 4"	3' - 4"	1	8' - 4"	
LV-3	2' - 6"	2' - 0"	1	12' - 0"	
LV-3	2' - 6"	2' - 0"	1	12' - 8"	
LV-3	2' - 6"	2' - 0"	1	12' - 8"	



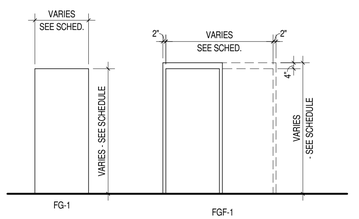
5 EXTERIOR DOOR SILL DETAIL
6" = 1'-0"



9 LOUVER ELEVATION
1/4" = 1'-0" 2/ A201


6" LOUVER SYSTEM
4"
FACE OF BRICK VENEER - BEYOND
MASONRY OPENING
END DAM - TYPICAL
CONT SILL PAN FLASHING
FACE OF CMU - BEYOND
BIRD / INSECT SCREEN
CONT BACKER ROD & SEALANT - TYP ENTIRE PERIM
CONT 2x PT WD BLKG
TRANSITION STRIP
INTERIOR
9 GAUGE, HORIZ JOINT REINF AT 16" O.C. VERT
UPSIDE DOWN CMU BOND BEAM SILL
MASONRY TIES, 16" O.C. VERTICALLY, 32" O.C. HORIZONTALLY
EXTERIOR

7 LOUVER - SILL DETAIL
3" = 1'-0" 9/ A801



FIBERGLASS DOORS AND FRAMES

SCALE: 1/4" = 1'-0"

SCALE: 1/4" = 1'-0"

SCALE: 3" = 1'-0"

SCALE: 6" = 1'-0"

Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD CHATHAM, MA 02633

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Consultants:

Revisions:

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COA:

Seal:
DANIEL G. TENNEY III — No. 6688 — CAMBRIDGE MA — COMMONWEALTH OF MASSACHUSETTS

Issued For:
BID

Scale: As indicated

Key Plan:

Date:	MARCH 30, 2022
Drawn By:	AF
Reviewed By:	BMc
Approved By:	DGT
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
DOOR & LOUVER SCHEDULES AND DETAILS

Sheet Number:
A801

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1.0 - GENERAL

1.01 THE STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ALL OTHER CONTRACT DRAWINGS AND SPECIFICATIONS. REFER TO CIVIL, ARCHITECTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR LOCATION, DIMENSIONS, AND DETAILS OF OPENINGS, SLEEVES, EMBEDMENTS, INSERTS, PADS, CURBS, DEPRESSIONS, ANCHOR BOLTS, AND OTHER PROJECT REQUIREMENTS NOT SHOWN ON STRUCTURAL DRAWINGS.

1.02 THE CONTRACTOR IS RESPONSIBLE FOR CHECKING, COORDINATING AND VERIFYING ALL DIMENSIONS IN THE FIELD PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL IMMEDIATELY REPORT ANY DISCREPANCY TO THE ARCHITECT AND ENGINEER AS A REQUEST FOR INFORMATION (RFI) BEFORE PROCEEDING WITH WORK.

1.03 THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IN THE FIELD THE EXISTENCE AND LOCATION OF OVERHEAD, BURIED AND/OR EMBEDDED UTILITIES, AND DETERMINING LOCATIONS OF ALL EMBEDDED MECHANICAL, ELECTRICAL AND PLUMBING SYSTEMS AFFECTED BY THE WORK OF THIS CONTRACT.

1.04 ALL WORK IS TO CONFORM WITH THE FOLLOWING CODES AND STANDARDS:

(A) "780 CMR: MASSACHUSETTS AMENDMENTS MASSACHUSETTS STATE BUILDING CODE" - 9TH EDITION (MSBC)
(B) INTERNATIONAL BUILDING CODE, (IBC 2015)
(C) "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" - AMERICAN CONCRETE INSTITUTE (ACI 318)
(D) "MANUAL OF STEEL CONSTRUCTION" - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC 360)
(E) "STRUCTURAL WELDING CODE - STEEL" - AMERICAN WELDING SOCIETY (AWS D1.1)
(F) "SEISMIC PROVISION FOR STRUCTURAL STEEL BUILDINGS" -AMERICAN INSTITUTE OF STEEL CONSTRUCTION, (AISC)
(G) "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES" - AMERICAN SOCIETY OF CIVIL ENGINEERS, (ASCE 7-10)

FOR ADDITIONAL CODES AND STANDARDS REFER TO SPECIFICATIONS.

1.05 THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AND ENGINEER OF UNFORESEEN CONDITIONS THAT MAY BE UNCOVERED DURING DEMOLITION AND CONSTRUCTION AS A REQUEST FOR INFORMATION (RFI) BEFORE PROCEEDING WITH WORK.

1.06 PERMANENT STRUCTURAL ELEMENTS TO BE DESIGNED IN ACCORDANCE WITH PERFORMANCE SPECIFICATIONS INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

(A) MISC. ARCH COMPONENT SEISMIC SUPPORTS
(B) MISC. MECHANICAL AND ELECTRICAL COMPONENT AND SYSTEM SEISMIC SUPPORTS
(C) LIGHT GAUGE COLD FORMED STEEL FRAMING

FOR PERFORMANCE DESIGN REQUIREMENTS OF ELEMENTS LISTED ABOVE, REFER TO ADDITIONAL NOTES ON THESE SHEETS AND IN THE TECHNICAL SPECIFICATIONS. ALL DESIGN SUBMITTAL DRAWINGS AND CALCULATIONS SHALL BE CERTIFIED, SIGNED AND SEALED BY A PROFESSIONAL STRUCTURAL ENGINEER REGISTERED IN THE STATE OF MASSACHUSETTS.

1.07 STRUCTURAL REQUIREMENTS TO ACCOMMODATE FIXED EQUIPMENT, INCLUDING BUT NOT LIMITED TO ROOF TOP UNITS ARE INCIDENTAL TO THE REQUIREMENTS OF A SPECIFIC EQUIPMENT MANUFACTURER. ALL WORK SHALL CONFORM TO APPROVED EQUIPMENT MANUFACTURER'S SHOP DRAWINGS AND INSTALLATION INSTRUCTIONS. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL ANY REQUIRED MODIFICATIONS TO ACCOMMODATE APPROVED EQUIPMENT DRAWINGS. SUCH MODIFICATIONS SHALL BE MADE AT NO COST TO THE OWNER.

1.08 DETAILS AND NOTES SHOWN ON STRUCTURAL DRAWINGS SHALL BE APPLICABLE TO ALL PARTS OF THE STRUCTURAL WORK EXCEPT WHERE SPECIFICALLY REQUIRED OTHERWISE BY CONTRACT DOCUMENTS. CONDITIONS NOT SPECIFICALLY SHOWN SHALL BE SIMILAR TO THOSE SHOWN FOR LIKE CONDITIONS AS DETERMINED BY THE ENGINEER.

1.09 IN ACCORDANCE WITH SPECIFICATION SECTION 01 45 23, TESTING AND INSPECTION OF STRUCTURAL WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE COSTS FOR TESTING AND INSPECTIONS WILL BE PAID BY THE CONTRACTOR. PROVIDE TEST RESULTS TO THE ENGINEER IN A TIMELY MANNER.

1.10 THE CONTRACTOR SHALL DESIGN AND PROVIDE ALL REQUIRED SHORING AND TEMPORARY BRACING TO RESIST FORCES ON THE STRUCTURE THROUGHOUT THE CONSTRUCTION PERIOD.

2.0 - FOUNDATIONS

2.01 THE SUBSURFACE CONDITIONS DESCRIBED IN THE DRAWINGS, SPECIFICATIONS, TEST BORINGS AND TEST PITS ARE INCLUDED ONLY TO ASSIST THE CONTRACTOR DURING BIDDING AND SUBSEQUENT CONSTRUCTION AND REPRESENT CONDITIONS ONLY AT THESE SPECIFIC LOCATIONS AT THE TIME THEY ARE MADE.

2.02 THE CONTRACTOR SHALL DESIGN AND PROVIDE ALL TEMPORARY EARTH SUPPORT, SHORING AND BRACING REQUIRED TO PERFORM THE WORK IN ACCORDANCE WITH OSHA, STATE AND LOCAL REQUIREMENTS.

2.03 THE CONTRACTOR SHALL DESIGN AND PROVIDE SHEETING, SHORING, BRACING, AND/OR UNDERPINNING IN ORDER TO PROTECT EXISTING UTILITIES FROM EXCESSIVE MOVEMENTS DURING THE CONSTRUCTION PERIOD, IN ACCORDANCE WITH OSHA, STATE & LOCAL REQUIREMENTS.

2.04 THE CONTRACTOR SHALL CARRY OUT CONTINUOUS CONTROL OF SURFACE AND SUBSURFACE WATER. DEWATER ANY AREAS REQUIRING EXCAVATION IN ADVANCE OF PERFORMING EXCAVATION. MAINTAIN GROUNDWATER LEVELS AT LEAST 2 FEET BELOW PLANNED SUBGRADES.

2.05 ALL SUBGRADES TO RECEIVE FILL MATERIALS, FOUNDATIONS, SLABS OR OTHER CONSTRUCTION SHALL BE FREE OF RUNNING OR STANDING WATER PRIOR TO PLACEMENT.

2.06 FOUNDATIONS SHALL BE INSTALLED IN THE GEOMETRY SHOWN IN THE PLANS, ANY ROCK ENCOUNTERED DURING EXCAVATION SHALL BE REMOVED TO CLEAR THE REQUIRED FOUNDATION GEOMETRY.

2.07 SPREAD FOOTING BEARING SURFACES SHALL BE EXCAVATED BY EQUIPMENT WITH A SMOOTH, TOOTHLESS CUTTING EDGE.

2.08 FOOTINGS HAVE BEEN DESIGNED FOR AN ASSUMED BEARING PRESSURE OF 3000 PSF

3.0 - CAST IN PLACE CONCRETE

3.01 CONCRETE WORK SHALL CONFORM TO "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318) AND "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS" (ACI 301).

3.02 CONCRETE SHALL BE CONTROLLED CONCRETE, PROPORTIONED, MIXED AND PLACED IN THE PRESENCE OF A REPRESENTATIVE OF AN APPROVED TESTING AGENCY.

3.03 UNLESS NOTED OTHERWISE, CONCRETE SHALL BE NORMAL WEIGHT AND HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH AS FOLLOWS:

(A) FOUNDATIONS: 4000 PSI
(B) INTERIOR SLABS-ON-GRADE, KNEEWALLS, CURBS, AND EQUIPMENT PADS: 4500 PSI
(C) EXTERIOR SLABS AND WALKWAYS: 5000 PSI

3.04 ALL PERMANENTLY EXPOSED VERTICAL AND HORIZONTAL CONCRETE SURFACES SHALL BE TREATED OR SEALED IN ACCORDANCE WITH PROJECT SPECIFICATIONS.

3.05 CONCRETE WORK SHALL BE COORDINATED WITH ALL ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL, PROCESS WORK, AND ALL EQUIPMENT. THE CONTRACTOR SHALL VERIFY INSTALLATION AND LOCATIONS OF ALL EMBEDDED ITEMS INCLUDING BUT NOT LIMITED TO INSERTS, ANCHOR BOLTS, DOWELS, BLOCKOUTS, SLEEVES, EMBEDDED PIPING, AND EMBEDDED CONDUIT PRIOR TO CONCRETE PLACEMENT.

3.06 FOR STRUCTURAL ELEMENTS, THE LOCATIONS AND MAXIMUM SPACINGS OF VERTICAL JOINTS SHALL BE AS FOLLOWS:

ELEMENT	JOINT TYPE	SPACING, FT.	LOCATIONS
FOUNDATION WALL	CONTRACTION	30	FACE OF
FOUNDATION WALL	CONSTRUCTION	60	PILASTER

3.07 FOR SLABS-ON-GRADE, LOCATE CONSTRUCTION OR CONTROL JOINTS ALONG COLUMN LINES OR AS SHOWN. PROVIDE JOINTS AT 20FT. MAX. SPACING. SUBMIT JOINT LOCATIONS AND DETAILS FOR APPROVAL.

3.08 SEALANT FOR CONTROL/CONTRACTION JOINTS AND SAW CUT JOINTS SHALL BE SIKADUR 51 MANUFACTURED BY SIKA OR AN APPROVED EQUAL.

3.09 CONCRETE EXPOSED TO WEATHER (FREEZE-THAW CONDITIONS) IN THE FINISHED PROJECT SHALL BE AIR ENTRAINED PER SPECIFICATIONS REQUIREMENTS.

3.10 A MINIMUM OF 72 HOURS SHALL ELAPSE BETWEEN ADJACENT CONCRETE PLACEMENTS.

3.11 CONCRETE SLABS SHALL BE PLACED SO THAT THE SLAB THICKNESS IS AT NO POINT LESS THAN THAT INDICATED ON THE DRAWINGS.

3.12 PROVIDE A 3/4" CHAMFER ON ALL VERTICAL AND HORIZONTAL CORNERS EXPOSED TO VIEW UNLESS NOTED OTHERWISE.

3.13 ALL CONCRETE SHALL BE WATER CURED UNLESS OTHERWISE AUTHORIZED BY THE ENGINEER.

3.14 NON-SHRINK, NON-METALLIC, GROUT SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 7,500 PSI (ASTM C942) AND A MINIMUM BOND STRENGTH OF 2,000 PSI AT 28-DAYS (ASTM C882). GROUT MAY BE EXTENDED WITH COARSE AGGREGATE PER THE MANUFACTURER'S RECOMMENDATIONS.

4.0 - CAST IN PLACE CONCRETE REINFORCEMENT

4.01 REINFORCEMENT DETAILING, FABRICATION, AND ERECTION SHALL CONFORM TO "ACI DETAILING MANUAL" - SP-66, "CRSI MANUAL OF STANDARD PRACTICE".

4.02 STEEL REINFORCEMENT, UNLESS NOTED OTHERWISE, SHALL CONFORM TO THE FOLLOWING:

(A) BARS, TIES, AND STIRRUPS___ASTM A615 GRADE 60
(B) WELDED WIRE FABRIC,ASTM A185, FLAT SHEETS

4.03 REINFORCING STEEL SHALL BE UNCOATED AND DEFORMED.

4.04 MINIMUM CONCRETE PROTECTIVE COVERING FOR REINFORCEMENT, UNLESS REQUIRED FOR FIRE PROTECTION OR NOTED OTHERWISE, SHALL BE AS FOLLOWS:

(A) CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH:____3"
(B) CONCRETE EXPOSED TO EARTH OR WEATHER:
(1) NO. 6 THRU NO. 18 BARS____2"
(2) NO. 5 BAR, W31 OR D31 WIRE AND SMALLER____2"
(C) SURFACES NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:
(1) SLABS, WALLS, JOISTS:
(a) NO. 14 AND NO 18 BARS____2"
(b) NO. 11 BARS AND SMALLER____2"
(2) BEAMS, COLUMNS:
(a) PRIMARY REINFORCEMENT____2-1/2"
(b) TIES, STIRRUPS, SPIRALS____2"

4.05 REINFORCING STEEL SHALL BE CONTINUOUS THROUGH ALL CONSTRUCTION JOINTS, CORNERS, AND INTERSECTIONS UNLESS OTHERWISE NOTED. REINFORCING SHALL BE LAPPED AT NECESSARY SPLICES OR HOOKED AT DISCONTINUOUS ENDS, UNLESS OTHERWISE NOTED.

4.06 FOR REINFORCING STEEL SPLICE LAP LENGTHS REFER TO THE TABLE PROVIDED UNLESS OTHERWISE INDICATED.

4.07 MECHANICAL SPLICES SHALL BE PERMITTED SUBJECT TO APPROVAL BY THE ENGINEER. MECHANICAL SPLICES SHALL DEVELOP AT LEAST 125 PERCENT OF THE SPECIFIED YIELD STRENGTH OF THE BAR. NO WELDED CONNECTIONS ARE PERMITTED.

4.08 WELDED WIRE FABRIC SHALL BE LAPPED (1) SQUARE PLUS (2) INCHES WHERE REQUIRED AND SHALL BE WIRED TOGETHER AT ALL LAPS. WWF SHALL BE SUPPORTED BY CHAIRS AND/OR CARRYING BARS PRIOR TO CONCRETE PLACEMENT.

4.09 REINFORCEMENT SHALL NOT BE TACK WELDED.

4.10 NOTIFY THE TESTING LAB AND ENGINEER A MINIMUM OF 48 HOURS PRIOR TO SCHEDULED CONCRETE PLACEMENT IN ORDER TO ACCOMMODATE INSPECTION OF REINFORCEMENT AND CONCRETE TESTING. NO CONCRETE SHALL BE PLACED WITHIN 48 HOURS OF SUCH NOTIFICATION.

4.11 WHERE REINFORCEMENT IS NOT SHOWN ON DRAWINGS, PROVIDE REINFORCEMENT IN ACCORDANCE WITH APPLICABLE DETAILS AS DETERMINED BY THE ARCHITECT AND ENGINEER. IN NO CASE SHALL REINFORCEMENT BE LESS THAN THE MINIMUM REINFORCEMENT PERMITTED BY THE CODES, NOR LESS THAN THE FOLLOWING:

(A) BEAM STIRRUPS: #3 @ 12"
(B) BEAM STIRRUP SUPPORTS: 1-#5 AT EACH STIRRUP BEND
(C) FACE REINFORCEMENT IN BEAMS OR PORTIONS OF BEAMS #4 @ 12" E.F.
(D) STRUCTURAL SLABS: 0.0020 X GROSS CONCRETE AREA IN EACH DIRECTION
(E) CONCRETE WALLS: 0.0025 X GROSS CONCRETE AREA IN EACH DIRECTION

4.12 WHERE REINFORCEMENT IS REQUIRED IN SECTION, REINFORCEMENT IS CONSIDERED TYPICAL WHEREVER THE SECTIONS APPLIES.

4.13 WHERE THERE IS CONFLICT BETWEEN LOCATIONS OF COLUMN VERTICAL BARS AND BEAM HORIZONTAL BARS, THE COLUMN BARS SHALL REMAIN IN THEIR DESIGNATED POSITIONS AND BEAM BAR LOCATIONS SHALL BE ADJUSTED.

4.14 DOWELS SHALL MATCH BAR SIZE, NUMBER AND SPACING, UNLESS NOTED OTHERWISE.

5.0 - MASONRY CONSTRUCTION

5.01 CLAY (BRICK) AND CONCRETE MASONRY (CMU) CONSTRUCTION SHALL CONFORM TO 'BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES' (ACI 530-13/ASCE 5-13/TMS402-13), AND TO 'SPECIFICATIONS FOR MASONRY STRUCTURES' (ACI 530, 1-13/ASCE 6-13/TMS 602-13).

5.02 MATERIALS STRENGTH SHALL BE AS FOLLOWS:

(A) CONCRETE MASONRY UNITS (CMU) SHALL CONFORM TO ASTM C-90 OF C-145 GRADE N-1.
(B) MORTAR SHALL CONFORM TO ASTM C-270, TYPE M OR S.
(C) GROUT SHALL CONFORM TO ASTM C-476 FINE OR COARSE.

5.03 MASONRY SHALL HAVE f'm = 1,500 PSI, f'm IS THE COMPRESSIVE STRENGTH OF THE MASONRY AT 28 DAYS AS DETERMINED BY PRISM TESTS, (SEE SPECIFICATIONS SECTION 04 20 00)

5.04 PRIOR TO GROUTING CELLS, BARS AND CELLS MUST BE INSPECTED BY THE TESTING AGENCY.

5.05 THE DESIGN OF REINFORCED MASONRY CONSTRUCTIONS IS BASED ON ALLOWABLE STRESSES PREDICATED ON 'WITH INSPECTION' PROVISIONS, REQUIRING THAT QUALIFIED MASONRY INSPECTION TAKE PLACE ON A CONTINUOUS BASIS WHENEVER MASONRY IS BEING PLACED.

5.06 REINFORCED MASONRY WALLS SHALL HAVE BOND BEAMS AT THE TOP OF EACH WALL AND SHALL BE CONTINUOUS WITH ALL INTERSECTING BOND BEAMS.

5.07 BONDING METHODS, TIES, LINTELS AND ACCESSORIES SHALL BE APPROVED BY THE ARCHITECT. ANCHORS SHALL ONLY BE INSTALLED IN FULLY GROUTED CELLS OF CONCRETE MASONRY.

5.08 MASONRY OPENINGS FOR UTILITIES ARE TO BE CLOSED UP WITH NEW MASONRY WORK AROUND THE UTILITY AND PROPERLY FIRESTOPPED WITH MATERIAL SPECIFIED BY ARCHITECT'S DRAWINGS AND SPECIFICATIONS.

5.09 PROVIDE 1-#5 VERTICAL REINFORCING AT 32" OC AT ALL MASONRY WALLS UNLESS NOTED OTHERWISE. THIS REINFORCING SHALL BE CONTINUOUS FULL HEIGHT AND SPLICED 2'-0" ABOVE EACH FLOOR LEVEL.

5.10 PROVIDE W1.7 (9 GAUGE) LADDER TYPE WIRE JOINT REINFORCING AT 16 INCHES VERTICAL SPACING UNLESS NOTED OTHERWISE.

5.11 MASONRY BLOCK CELLS CONTAINING VERTICAL REINFORCING SHALL BE GROUTED SOLID. FILLING CELLS WITH MORTAR IS UNACCEPTABLE. THE COMPRESSIVE STRENGTH OF GROUT AT THE END OF 28 DAYS SHALL BE 3,000 PSI MINIMUM.

5.12 PROVIDE 2-#5 CONTINUOUS HORIZONTAL BARS IN THE TOP COURSE OF WALLS AND IN BOND BEAMS SPACED AT MAXIMUM OF 4' - 0" O.C. VERT.

6.0 - STRUCTURAL STEEL

6.01 STRUCTURAL STEEL DESIGN, FABRICATION AND ERECTION SHALL CONFORM TO THE AISC "MANUAL OF STEEL CONSTRUCTION", "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS AND BRIDGES" (ANSI/AISC 360-10), AND "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (ANSI/AISC 303-10).

6.02 STRUCTURAL STEEL SHALL BE NEW STEEL CONFORMING TO THE FOLLOWING:

(A) WIDE FLANGE SHAPES:_____ASTM A992
(B) OTHER STEEL SHAPES, PLATES AND BARS:_____ASTM A572 OR ASTM A36.
(C) STRUCTURAL TUBING:_____ASTM A500 GR B.

6.03 ALL WELDED CONNECTIONS SHALL BE MADE BY APPROVED CERTIFIED WELDERS AND SHALL CONFORM TO A.W.S. SPECIFICATIONS AMENDED TO DATE. ELECTRODES SHALL BE E70XX.

6.04 BOLTS SHALL CONFORM TO ASTM A325 AND BE INSTALLED SNUG-TIGHT UNLESS NOTED OTHERWISE

6.05 STRUCTURAL STEEL FRAMING SHALL BE WITHIN TOLERANCE BEFORE CONNECTIONS ARE FINALLY BOLTED OR WELDED.

6.06 FIELD CUTTING OF STRUCTURAL STEEL OR ANY FIELD MODIFICATIONS OF STRUCTURAL STEEL SHALL NOT BE MADE WITHOUT PRIOR WRITTEN APPROVAL BY THE ENGINEER FOR EACH SPECIFIC USE.

6.07 STRUCTURAL STEEL SHAPES AND PLATES SHALL BE HOT-DIPPED GALVANIZED PER ASTM A123 U.N.O. FASTENERS SHALL BE HOT-DIPPED GALVANIZED PER ASTM A153 U.N.O. HOT-DIPPED GALVANIZING SHALL ALSO CONFORM TO ASTM A385. THE GALVANIZER SHALL SUBMIT A CERTIFICATE OF CONFORMANCE FOR RECORD.

6.08 PROVIDE FIELD TOUCH-UP AND REPAIR OF GALVANIZING AS REQUIRED PER ASTM A780 USING AN INORGANIC ZINC-RICH PRIMER.

6.09 WHEN DISSIMILAR METALS ARE IN CONTACT (E.G. STAINLESS STEEL IN CONTACT WITH GALVANIZED STEEL), COAT SURFACE WITH COAL TAR EPOXY OR PROVIDE OTHER APPROVED MEANS TO PROVIDE A BARRIER.

6.10 WELDS SHALL BE 1/4" FILLET WELDS MINIMUM UNLESS NOTED OTHERWISE ON THE DRAWINGS.

6.11 PROVIDE TEMPORARY ERECTION BRACING AND SUPPORTS TO HOLD STRUCTURAL STEEL FRAMING SECURELY IN POSITION. SUCH TEMPORARY BRACING AND SUPPORTS SHALL NOT BE REMOVED UNTIL PERMANENT BRACING HAS BEEN INSTALLED.

6.12 SUBMIT SHOP DRAWINGS AND PRODUCT DATA FOR APPROVAL PRIOR TO FABRICATION.

8.0 - POST INSTALLED CONCRETE ANCHORS AND REINFORCING DOWELS

8.01 ADHESIVE ANCHORS AND REINFORCING DOWELS SHALL BE HILTI HIT-HY-200 ADHESIVE ANCHORING SYSTEM.

8.02 EXPANSION ANCHORS SHALL BE HILTI KWIK BOLT TZ EXPANSION ANCHORS.

8.03 INSTALL ANCHORS IN STRICT CONFORMANCE WITH THE MANUFACTURER'S REQUIREMENTS.

8.04 HOLES SHALL BE THOROUGHLY CLEANED AND DRY PRIOR TO INSTALLING ANCHORS.

8.05 DO NOT DAMAGE EXISTING REINFORCING. LOCATE REINFORCING WITH PROFOMETER OR OTHER MEANS PRIOR TO DRILLING CONCRETE.

8.06 ANCHORS INSTALLED OVERHEAD SHALL BE PROOF TESTED BY THE MANUFACTURER'S FIELD ENGINEER OR OTHER APPROVED AGENCY. PROOF TEST A MINIMUM OF 25% OF THE ANCHORS OR (2) TOTAL, WHICHEVER IS GREATER.

9.0 - DESIGN LOADS:

9.01 GENERAL DESIGN REQUIREMENTS_____(IBC 2015, SECTION 1604)
(A) RISK CATEGORY_____IV (ASCE 7-10, TABLE 1-1)
(B) MUNICIPALITY_____CHATHAM, MA (780 CMR, TABLE 1604.11)

9.02 DESIGN LOADS
(A) SELF-WEIGHT OF ALL ATTACHED AND SUSPENDED ELEMENTS
TRUSS TOP CHORD DEAD LOAD: SELF WEIGHT + 25 PSF ROOF ASSEMBLY + 8 PSF COLLATERAL
TRUSS BOTTOM CHORD DEAD LOAD: SELF WEIGHT + 8 PSF COLLATERAL

9.03 LIVE LOADS
(A) FLOOR LIVE LOADS_____100 PSF
(B) ROOF LIVE LOADS_____20 PSF, 300 LB

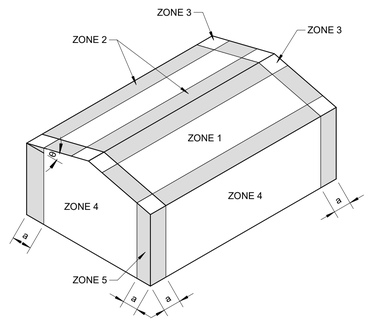
9.04 ROOF SNOW LOAD _____(IBC 2015, SECTION 1608)

(A) GROUND SNOW LOAD, Pg _____25 PSF (780 CMR, TABLE 1604.11)
(B) SNOW LOAD, Pf _____25 PSF (MA, STATE BUILDING CODE CHAPTER 16 (AMENDED)
(C) SNOW EXPOSURE FACTOR, Ce _____1.1 (ASCE 7-10, TABLE 7-2)
(D) THERMAL FACTOR, Ct _____1.0 (ASCE 7-10, TABLE 7-3)
(E) SNOW LOAD IMPORTANCE FACTOR, IS _____1.1 (ASCE 7-10, TABLE 7-4)
(F) ROOF SLOPE FACTOR, Cs _____1.0 (ASCE 7-10, FIGURE 7-2)
(G) * ADJUST FOR SNOW DRIFT AND UNBALANCED SNOW LOADING _____(MSBC 780 CMR)
(H) SLOPED ROOF SNOW LOAD, Ps _____25 PSF

9.05 WIND LOADS _____(IBC 2015, SECTION 1609)

(A) BASIC WIND SPEED, V (3-SECOND GUST WIND SPEED) _____154 MPH (780 CMR, TABLE)
(B) BUILDING ENCLOSURE CLASSIFICATION _____ENCLOSED (ASCE 7-10, SEC. 6.2)
(C) WIND EXPOSURE CATEGORY _____C (ASCE 7-10, SEC. 6.5.6.3)
(D) DESIGN BUILDING DIMENSIONS
(E) COMPONENTS AND CLADDING _____(ASCE 7-10, SEE TABLE)
(1) ANALYSIS PROCEDURE _____LOW RISE BUILDINGS (ASCE 7-10)
(a) WIND DIRECTIONALITY FACTOR, Kd _____0.85 (ASCE 7-10, TABLE 26.6-1)
(b) TOPOGRAPHIC FACTOR, Kzt _____1.0 (ASCE 7-10, SECTION 26.8)
(c) VELOCITY PRESSURE COEFFICIENT, Kz _____0.94 (ASCE 7-10, TABLE 27.3-1)
(d) INTERNAL PRESSURE COEFFICIENT, GCpi _____+/-0.18 (ASCE 7-10, TABLE 26.11-1)

COMPONENTS AND CLADDING WIND PRESSURE LOADS ON BUILDING



WIND PRESSURE DIAGRAM

COMPONENTS AND CLADDING WIND PRESSURES

ZONE	TRIBUTARY AREA [SF]	ADJUSTED PRESSURE [PSF]
1 ROOF	10	+33.18, -52.70
	50	+26.38, -49.30
	100	+23.46, -47.84
2 ROOF	10	+33.18, -91.88
	50	+26.38, -74.76
	100	+23.46, -67.42
3 ROOF	10	+33.18, -135.86
	50	+26.38, -115.34
	100	+23.46, -106.54
4 WALL	10	+57.70, -62.56
	50	+51.57, -56.51
	100	+49.03, -53.89
5 WALL	10	+57.70, -77.22
	50	+51.57, -65.10
	100	+49.03, -59.97
2o ROOF OVERHANG	10	-115.97
	50	-107.54
	100	-107.54
3o ROOF OVERHANG	10	-194.94
	50	-139.78
	100	-122.20

NOTE(S):

1. MINIMUM PRESSURE ON ANY SURFACE SHALL BE 16 PSF.
2. TABLE PRESSURES ARE FOR SQUARE FOOT [SF] TRIBUTARY AREA, FOR OTHER AREAS LINEAR INTERPOLATION BETWEEN AREAS ABOVE.
3. POSITIVE PRESSURES ACT TOWARDS THE BUILDING, NEGATIVE ACT AWAY FROM THE BUILDING.
4. OVERHANGING ZONES 2o AND 3o SHALL BE APPLIED TO CANOPIES.
5. ADJUSTMENT FACTOR FOR BUILDING HEIGHT AND EXPOSURE = 1.00
6. a = 4.4 FT.
7. DETAIL IS APPLICABLE FOR ROOF SLOPES 7˚ < θ < 27˚

9.06 EARTHQUAKE LOADS _____(IBC 2015, SECTION 1613)
(A) SITE CLASS _____E
(B) SPECTRAL RESPONSE ACCELERATIONS
(1) Ss _____0.135 (780 CMR, TABLE 1604.11)
(2) S1 _____0.051 (780 CMR, TABLE 1604.11)
(C) SPECTRAL RESPONSE COEFFICIENTS
(1) Sds _____0.225 (ASCE 7-10, SEC. 11.4.3)
(2) Sd1 _____0.119 (ASCE 7-10, SEC. 11.4.3)
(D) SEISMIC DESIGN CATEGORY _____C (ASCE 7-10, SEC 11.6-1)
(E) SEISMIC IMPORTANCE FACTOR, Ie _____1.5 (ASCE 7-10, TABLE 11.5-1)
(F) SEISMIC FORCE RESISTING SYSTEM: _____(780 CMR, TABLE 12.2-1)
(1) INTERMEDIATE REINFORCED MASONRY SHEAR WALLS
(a) RESPONSE MODIFICATION COEFFICIENT, R _ 3.5
(b) SYSTEM OVERSTRENGTH PARAMETER,Ωo _ 2.5
(c) DEFLECTION AMPLIFICATION FACTOR, Cd _ 2.25

(G) ANALYSIS PROCEDURE_____EQUIVALENT LATERAL FORCE ANALYSIS (ASCE 7-10, SEC. 12.8)

10.0 - BUILDING DEFLECTION LIMITS

BUILDING DEFLECTION LIMITS			
CONSTRUCTION	LIVE	SNOW OR WIND (c)	DEAD+LIVE
ROOF MEMBER (d) SUPPORTING PLASTER CEILING SUPPORTING NON PLASTER CEILING	(a) L/360 L/240 L/180	(a) L/360 L/240 L/180	 L/360 L/240 L/180
FLOOR MEMBERS	(b) L/360	-	 L/240
EXTERIOR WALLS AND INTERIOR PARTITIONS WITH MASONRY VENEER ALL OTHER CASES	-	 L/600 L/240	-

(A) TOTAL ROOF SNOW LOAD DEFLECTION SHALL NOT EXCEED 1 1/4".
(B) TOTAL FLOOR LIVE LOAD DEFLECTION SHALL NOT EXCEED 1".
(C) WIND DEFLECTIONS MAY BE BASED ON A 10-YEAR WIND.
(D) DEFLECTIONS OF MEMBERS SUPPORTING CRANES SHALL MEET DEFLECTION CRITERIA REQUIRED BY THE CRANE MANUFACTURER OR AS SPECIFIED IN THE ABOVE, WHICHEVER IS MORE STRINGENT.

Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD CHATHAM, MA 02633

WELLS 10 AND 11 PUMPING AND TREATMENT DESIGN
MILL HILL ROAD CHATHAM, MA 02633

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Consultants:

Revisions:

No.	Date	Description

COA:

Seal:
COMMONWEALTH OF MASSACHUSETTS
NATHAN M. SEIFERT
STRUCTURAL
No. 41693
REGISTERED
PROFESSIONAL ENGINEER
3/30/2022

Issued For:
BID

Scale: As indicated

Key Plan:

NORTH

Date:	MARCH 30, 2022
Drawn By:	AAC
Reviewed By:	EJP
Approved By:	NMS
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
GENERAL NOTES

Sheet Number:
S001

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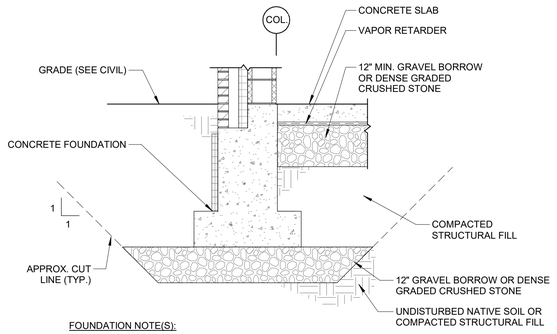


FOUNDATION NOTE(S):

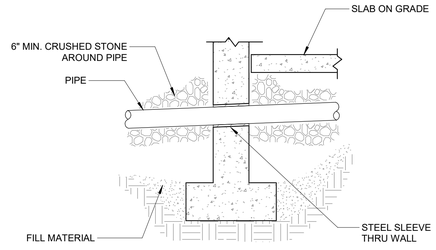
1. UNDOCUMENTED FILL AND LOOSE OR DISTURBED SOILS SHALL BE REMOVED FROM ALL FOUNDATION AREAS. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO FOUNDATION CONSTRUCTION TO OBSERVE ALL FOUNDATION SUBGRADES. REFER TO DETAIL 7/S002 AND EARTHWORK SPECIFICATION FOR LIMITS OF UNSUITABLE SOILS REMOVAL AND BACKFILL REQUIREMENTS BELOW FOUNDATIONS AND SLABS.
2. 12-INCHES OF GRAVEL BORROW OR DENSE GRADED CRUSHED STONE SHALL BE PLACED AND COMPACTED AT THE BASE OF FOOTING EXCAVATIONS.
3. THE CONTRACTOR IS RESPONSIBLE FOR SUBGRADE PROTECTION.

SLAB NOTE(S):

1. A MINIMUM OF 12-INCHES OF GRAVEL BORROW OR DENSE GRADED CRUSHED STONE SHALL BE PLACED BELOW SLABS. REFER TO EARTHWORK SPECIFICATION FOR PLACEMENT AND COMPACTION REQUIREMENTS. THE CONTRACTOR SHALL CONTACT THE ENGINEER PRIOR TO PLACEMENT TO EVALUATION SUBGRADE CONDITIONS.
2. REFER TO DETAIL 7/S002 AND EARTHWORK SPECIFICATION FOR LIMITS OF UNSUITABLE SOILS REMOVAL AND BACKFILL REQUIREMENTS BELOW FOUNDATIONS AND SLABS.
3. IF UNDERSLAB STONE IS TRAPPING WATER, THE WATER SHALL BE REMOVED PRIOR TO SLAB PLACEMENT.

1 TYPICAL CUT/FILL DETAIL

SCALE: 1/2" = 1'-0"

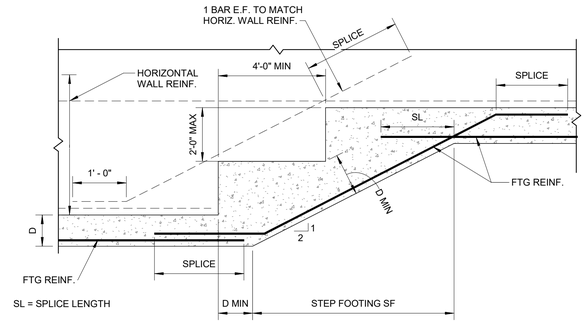


NOTE(S):

1. PIPE SHALL NOT PASS UNDER OR THRU WALL FOOTING. LOWER FOOTING BY STEPPING TO AVOID INTERFERENCE.

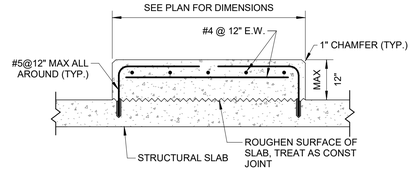
2 PIPE THROUGH FOUNDATION WALL

SCALE: 3/4" = 1'-0"



3 STEP FOOTING DETAIL

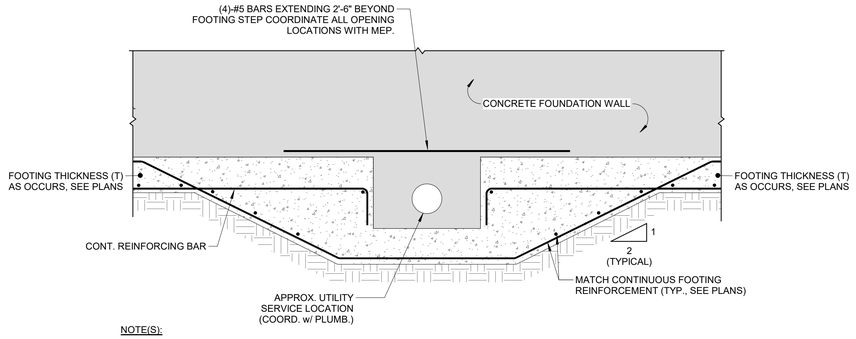
SCALE: 3/4" = 1'-0"



THE EXACT SIZE, SHAPE AND LOCATION OF EQUIPMENT (HOUSEKEEPING) PAD(S) SHALL BE DETERMINED BY THE CONTRACTOR AFTER APPROVAL OF SHOP DRAWINGS FOR EQUIPMENT. ANCHOR BOLTS WHERE REQUIRED SHALL BE SIZED AND LOCATED ACCORDING TO MANUFACTURER'S REQUIREMENTS.

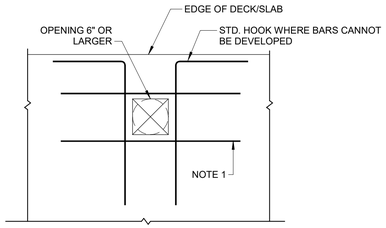
4 CONCRETE EQUIPMENT PAD

SCALE: 3/4" = 1'-0"


(4)-#5 BARS EXTENDING 2'-6" BEYOND FOOTING STEP COORDINATE ALL OPENING LOCATIONS WITH MEP.
CONCRETE FOUNDATION WALL
FOOTING THICKNESS (T) AS OCCURS, SEE PLANS
FOOTING THICKNESS (T) AS OCCURS, SEE PLANS
CONT. REINFORCING BAR
1
2
(TYPICAL)
APPROX. UTILITY SERVICE LOCATION (COORD. w/ PLUMB.)
MATCH CONTINUOUS FOOTING REINFORCEMENT (TYP., SEE PLANS)

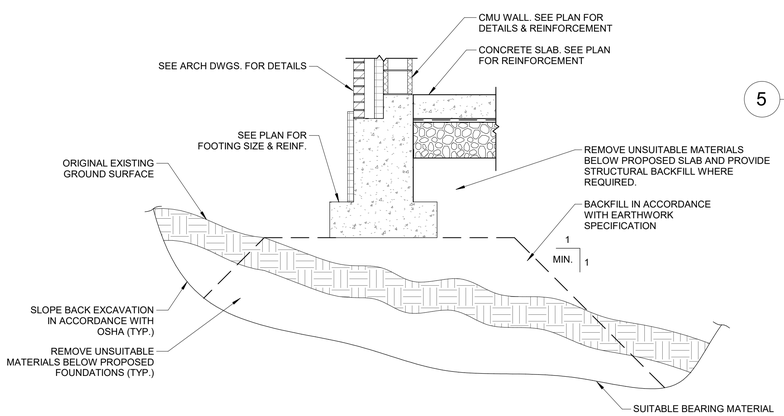
NOTE(S):

1. REFER TO ARCH./CIVIL/GEOTECHNICAL DETAILS FOR ADDITIONAL UNDER SLAB & FOUNDATION REQUIREMENTS NOT SHOWN ON THESE DRAWINGS. REQUIREMENTS MAY INCLUDE BUT ARE NOT LIMITED TO: PERIMETER DRAINS, INSULATION, WEEP HOLES, & SITE PREPARATION. REPORT ANY DISCREPANCIES BETWEEN DISCIPLINES TO A/E FOR CLARIFICATION PRIOR TO PROCEEDING WITH WORK.



NOTE(S):

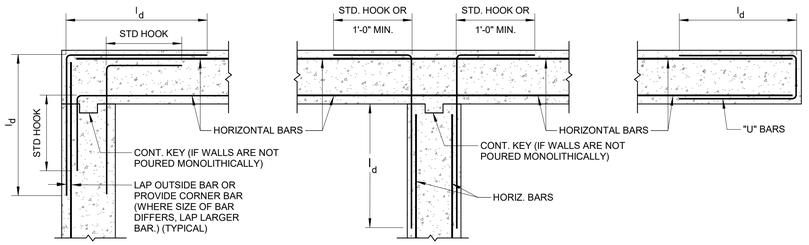
1. #5 ADDL EACH FACE MIN; BUT NOT LESS THAN 50% OF INTERRUPTED WALL REINF EACH SIDE OF OPENING. SPACE BARS AT 3" OC, EACH FACE. LENGTH OF ADDL REINF = L OR H+(2XSPLICE LENGTH).
2. FOR MINIMUM SPLICE LENGTH. SEE TABLE


CMU WALL. SEE PLAN FOR DETAILS & REINFORCEMENT
CONCRETE SLAB. SEE PLAN FOR REINFORCEMENT
SEE ARCH DWGS. FOR DETAILS
SEE PLAN FOR FOOTING SIZE & REINF.
REMOVE UNSUITABLE MATERIALS BELOW PROPOSED SLAB AND PROVIDE STRUCTURAL BACKFILL WHERE REQUIRED.
ORIGINAL EXISTING GROUND SURFACE
BACKFILL IN ACCORDANCE WITH EARTHWORK SPECIFICATION
1
MIN.
1
SLOPE BACK EXCAVATION IN ACCORDANCE WITH OSHA (TYP.)
REMOVE UNSUITABLE MATERIALS BELOW PROPOSED FOUNDATIONS (TYP.)
SUITABLE BEARING MATERIAL

NOTES:
1. REFER TO EARTHWORK SPECIFICATION FOR DESCRIPTION OF UNSUITABLE MATERIALS AND SUITABLE BEARING MATERIAL.

5 UTILITY OPENING

SCALE: 1/2" = 1'-0"



NOTE(S):

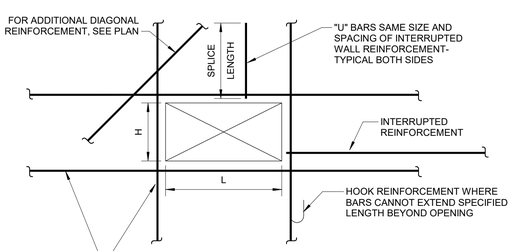
1. VERTICAL BARS NOT SHOWN FOR CLARITY. (TYP.)
2. FOR LENGTH OF ld, REFER TO SPLICE AND DEVELOPMENT LENGTH TABLE.

6 SUPPLEMENTAL SLAB REINFORCING

SCALE: 1/2" = 1'-0"

8 HORIZONTAL WALL REINFORCING PLAN

SCALE: 1/2" = 1'-0"

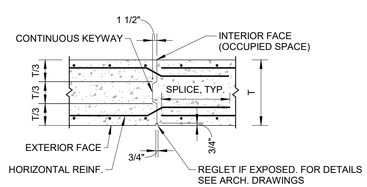

FOR ADDITIONAL DIAGONAL REINFORCEMENT, SEE PLAN
SPLICE
LENGTH
"U" BARS SAME SIZE AND SPACING OF INTERRUPTED WALL REINFORCEMENT- TYPICAL BOTH SIDES
H
INTERRUPTED REINFORCEMENT
L
HOOK REINFORCEMENT WHERE BARS CANNOT EXTEND SPECIFIED LENGTH BEYOND OPENING
2-#5 ADDL EACH FACE MIN; BUT NOT LESS THAN 50% OF INTERRUPTED WALL REINF EACH SIDE OF OPENING. SPACE BARS AT 3" OC, EACH FACE. LENGTH OF ADDL REINF = L+(2xSPLICE LENGTH).

NOTES:

1. WALL OPENINGS SHALL BE COORDINATED AND DETAILED ON THE REINFORCEMENT SHOP DRAWINGS.

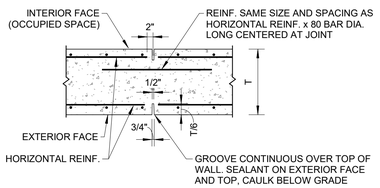
11 REINFORCEMENT AT OPENINGS IN REINFORCED CONCRETE WALLS

SCALE: 3/4" = 1'-0"



7 TYPICAL REMOVAL OF UNSUITABLE MATERIALS

SCALE: 1/2" = 1'-0"


INTERIOR FACE (OCCUPIED SPACE)
2"
REINF. SAME SIZE AND SPACING AS HORIZONTAL REINF. x 80 BAR DIA. LONG CENTERED AT JOINT
1/2"
T
EXTERIOR FACE
3/4"
T/6
HORIZONTAL REINF.
GROOVE CONTINUOUS OVER TOP OF WALL. SEALANT ON EXTERIOR FACE AND TOP, CAULK BELOW GRADE

9 VERTICAL CONSTRUCTION JOINT (WALL)

SCALE: 1/2" = 1'-0"

10 VERTICAL CONTROL JOINT (WALL)

SCALE: 1/2" = 1'-0"

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NATHAN M. SEIFERT
STRUCTURAL
No. 41693
REGISTERED
PROFESSIONAL ENGINEER
3/30/2022

Issued For:
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Scale: As indicated

Key Plan:

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Date:	MARCH 30, 2022
Drawn By:	AAC
Reviewed By:	EJP
Approved By:	NMS
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
TYPICAL DETAILS I

Sheet Number:
S002

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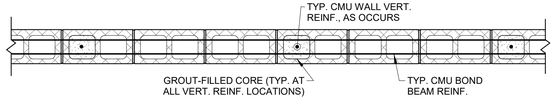
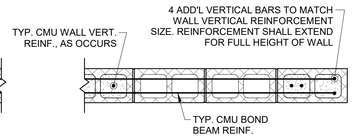
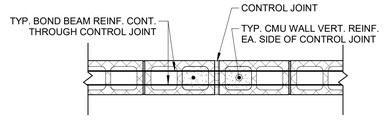


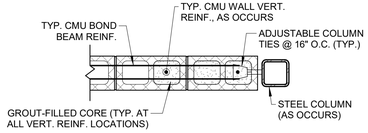
TYPICAL CONTINUOUS WALL REINFORCEMENT DETAIL


TYP. CMU WALL VERT. REINF., AS OCCURS
4 ADD'L VERTICAL BARS TO MATCH WALL VERTICAL REINFORCEMENT SIZE. REINFORCEMENT SHALL EXTEND FOR FULL HEIGHT OF WALL
TYP. CMU BOND BEAM REINF.

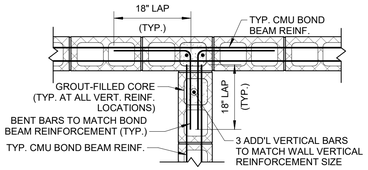
TYPICAL OPEN END WALL REINFORCEMENT DETAIL



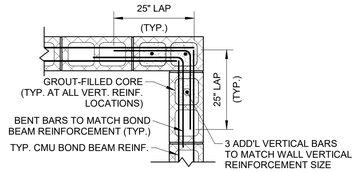
TYPICAL REINFORCEMENT AT CONTROL JOINT


TYP. CMU BOND BEAM REINF.
TYP. CMU WALL VERT. REINF., AS OCCURS
ADJUSTABLE COLUMN TIES @ 16" O.C. (TYP.)
STEEL COLUMN (AS OCCURS)
GROUT-FILLED CORE (TYP. AT ALL VERT. REINF. LOCATIONS)

TYPICAL STEEL COLUMN/ CMU WALL INTERFACE


18" LAP (TYP.)
TYP. CMU BOND BEAM REINF.
GROUT-FILLED CORE (TYP. AT ALL VERT. REINF. LOCATIONS)
18" LAP (TYP.)
BENT BARS TO MATCH BOND BEAM REINFORCEMENT (TYP.)
TYP. CMU BOND BEAM REINF.
3 ADD'L VERTICAL BARS TO MATCH WALL VERTICAL REINFORCEMENT SIZE

TYPICAL WALL INTERSECTION REINFORCEMENT DETAIL


25" LAP (TYP.)
GROUT-FILLED CORE (TYP. AT ALL VERT. REINF. LOCATIONS)
25" LAP (TYP.)
BENT BARS TO MATCH BOND BEAM REINFORCEMENT (TYP.)
TYP. CMU BOND BEAM REINF.
3 ADD'L VERTICAL BARS TO MATCH WALL VERTICAL REINFORCEMENT SIZE

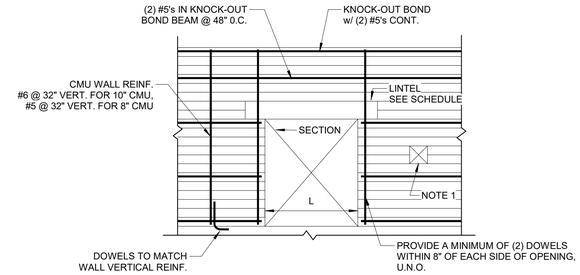
TYPICAL WALL CORNER REINFORCEMENT DETAIL

NOTE(S):

1. ALL CMU VERTICAL REINFORCED CORES AND HORIZONTAL REINFORCED COURSES (BOND BEAMS) SHALL BE GROUTED SOLID. GROUTING OF HORIZONTAL REINFORCEMENT NOT SHOWN ON THIS DETAIL FOR CLARITY.

1 TYPICAL MASONRY REINFORCING DETAILS

SCALE: 3/4" = 1'-0"

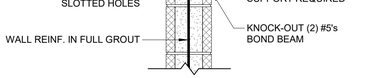

(2) #5's IN KNOCK-OUT BOND BEAM @ 48" O.C.
KNOCK-OUT BOND w/ (2) #5's CONT.
CMU WALL REINF. #6 @ 32" VERT. FOR 10" CMU, #5 @ 32" VERT. FOR 8" CMU
LINTEL SEE SCHEDULE
SECTION
L
NOTE 1
DOWELS TO MATCH WALL VERTICAL REINF.
PROVIDE A MINIMUM OF (2) DOWELS WITHIN 8" OF EACH SIDE OF OPENING, U.N.O.

NOTE(S):

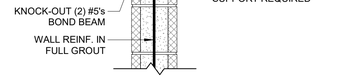
1. REINFORCEMENT ADJACENT TO OPENINGS NEED NOT BE PROVIDED FOR OPENINGS SMALLER THAT 16-INCHES IN EITHER HORIZONTAL OR VERTICAL DIRECTION, UNLESS DISTRIBUTED REINFORCING IS INTERRUPTED BY SUCH OPENINGS.
2. FOR WINDOWS AND SIMILAR OPENINGS THAT DO NOT EXTEND TO THE FLOOR, PROVIDE (2) #5 HORIZONTAL BARS AT BOTTOM OF OPENING, EXTEND PAST OPENING 24" EACH SIDE.

2 MASONRY PARTITION REINFORCING

SCALE: 3/4" = 1'-0"


BOT. CHORD OF TRUSS
FASTEN TO BOT. CHORD w/ (2) 3/4" BOLTS
5/8" ANCHORS @ 32" O.C. IN VERT. SLOTTED HOLES
CONT. 8X4X7/16 TRUSS TO TRUSS WHERE CMU SUPPORT REQUIRED
KNOCK-OUT (2) #5's BOND BEAM
WALL REINF. IN FULL GROUT

WALL PERPENDICULAR TO TRUSS

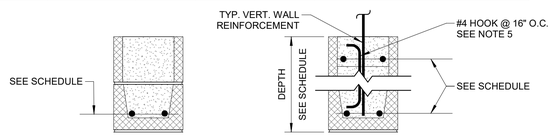

BOT. CHORD OF TRUSS
FASTEN TO BOT. CHORD w/ (2) 3/4" BOLTS
5/8" ANCHORS @ 32" O.C. IN VERT. SLOTTED HOLES
CONT. 8X4X7/16 TRUSS TO TRUSS WHERE CMU SUPPORT REQUIRED
KNOCK-OUT (2) #5's BOND BEAM
WALL REINF. IN FULL GROUT

WALL PARALLEL TO TRUSS

3 MASONRY PARTITION BRACING DETAILS

SCALE: 1" = 1'-0"

LABEL	CLEAR SPAN L	REINFORCING IN LINTEL				END BEARING	DEPTH (FULLY GROUTED)
		6" WALL	8" WALL	10" WALL	12" WALL		
L-4	UP TO 4'-0"	1-#5	2-#5	2-#5	2-#6	8"	8"
L-5	TO 5'-0"	1-#5	2-#5	2-#5	2-#6	8"	16"
L-6	TO 6'-0"	2-#5	2-#5	2-#5	2-#6	8"	16"
L-7	TO 7'-0"	2-#5	2-#6	2-#6	2-#6	8"	16"
L-8	TO 8'-0"	2-#5	2-#7	2-#7	3-#6	8"	16"
L-9	TO 9'-0"	2-#6	2-#8	2-#8	2-#8	8"	24"
L-10	TO 10'-0"	-	-	2-#8	2-#8	8"	48"



CONC. BLOCK LINTEL
SPANS UP TO 5'-0"

CONC. BLOCK LINTEL
SPANS OVER 5'-0" TO 12'-0"

NOTE(S):

1. GROUT f'c = 5000 PSI
2. MASONRY LOCATED AT MEZZANINES (LOAD BEARING LINTELS) SHALL ALL BE GROUTED SOLID TO THE TOP OF WALL.
3. REINFORCING SHALL EXTEND A MIN. OF 40 BAR DIAMETERS PAST THE OPENING (BUT NOT LESS THAN 24") IN FULL GROUT.
4. CMU f'm = 1,500 PSI (MIN.)
5. PROVIDE #4 SHEAR REINF. IN ADDITION TO TYP. VERT. REINFORCEMENT. CONTINUE SHEAR REINF. 24" PAST THE OPENING.

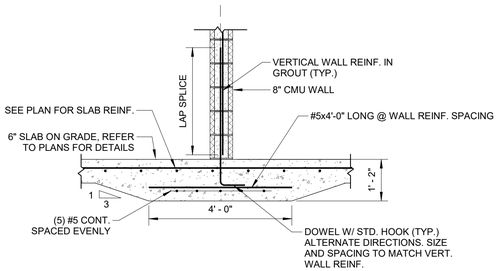
4 MASONRY LINTEL SCHEDULE

SCALE: 1" = 1'-0"

TENSION DEVELOPMENT & SPLICE LENGTHS FOR BARS				
	f'c = 4,000 PSI		f'c = 5,000 PSI	
BAR SIZE	TOP BARS (IN.)	OTHER BARS (IN.)	TOP BARS (IN.)	OTHER BARS (IN.)
#3	24	19	22	17
#4	32	25	29	22
#5	40	31	36	28
#6	48	37	43	33
#7	70	54	63	49
#8	80	62	72	55
#9	91	70	81	63
#10	102	79	91	70
#11	113	87	101	78

5 MINIMUM SPLICE DEVELOPEMENT LENGTHS

SCALE: 1/2" = 1'-0"


VERTICAL WALL REINF. IN GROUT (TYP.)
8" CMU WALL
LAP SPLICE
SEE PLAN FOR SLAB REINF.
#5x4'-0" LONG @ WALL REINF. SPACING
6" SLAB ON GRADE, REFER TO PLANS FOR DETAILS
1'-2"
1
3
4' - 0"
(5) #5 CONT. SPACED EVENLY
DOWEL W/ STD. HOOK (TYP.) ALTERNATE DIRECTIONS. SIZE AND SPACING TO MATCH VERT. WALL REINF.

6 MASONRY PARTITION FOUNDATION

SCALE: 1/2" = 1'-0"

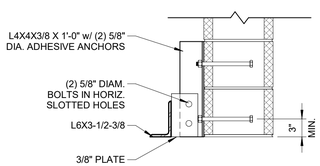
STEEL ANGLE LINTEL SCHEDULE		
LABEL	MASONRY OPENING	WALL THICKNESS
		4" WALL
SL-3	3'-0"	1-L3 1/2x31/2x5/16
SL-4	4'-0"	1-L4x31/2x5/16
SL-5	5'-0"	1-L4x31/2x3/8
SL-6	6'-0"	1-L5x31/2x3/8
SL-8	8'-0"	1-L6x31/2x3/8

NOTE(S):

1. PROVIDE AND INSTALL LINTEL ANGLES FOR MASONRY OPENINGS IN ACCORDANCE WITH THE SCHEDULE ABOVE. INSTALL LONG LEG VERTICAL. SEE ARCHITECTURAL & MECHANICAL PLANS FOR LOCATIONS.
2. PROVIDE 6" MIN. BEARING AT EACH END BUT NOT LESS THAN 1" PER FOOT OF SPAN. FILL 2 COURSES OF MASONRY BELOW BEARING WITH MORTAR.
3. WHERE MINIMUM BEARING CANNOT BE PROVIDED, ATTACH SECURELY TO ADJACENT STRUCTURAL MEMBERS OR PROVIDE SEPARATE SUPPORTS.
4. MINIMUM THICKNESS SHALL BE 5/16" AND ALL ANGLES SHALL BE HOT DIP GALVANIZED.
5. WHERE WALL THICKNESS EXCEEDS 12" PROVIDE ON ADDITIONAL ANGLE FOR EACH ADDITIONAL 4" OF WALL.

7 STEEL ANGLE LINTEL SCHEDULE

SCALE: 3/4" = 1'-0"



NOTE:

1. PROVIDE FOR LOOSE LINTELS OVER 6'-0". SPACE SUPPORTS AT 3'-4" MAX. SPACING

8 STEEL ANGLE LINTEL SUPPORTS

SCALE: 1" = 1'-0"

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NATHAN M. SEIFERT
STRUCTURAL
No. 41693
REGISTERED PROFESSIONAL ENGINEER
3/30/2022

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Date:	MARCH 30, 2022
Drawn By:	AAC
Reviewed By:	EJP
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W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
TYPICAL DETAILS II

Sheet Number:
S003

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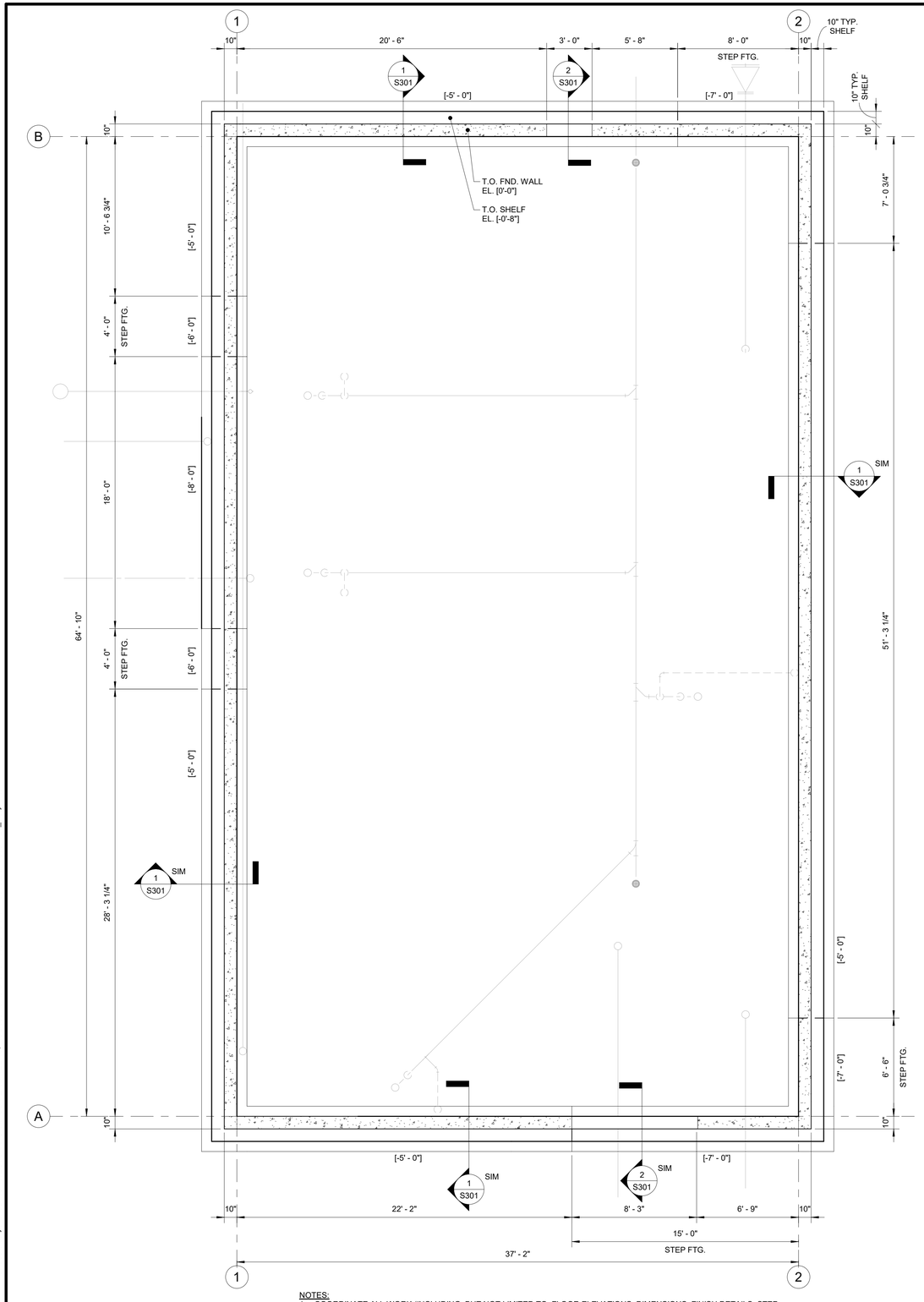
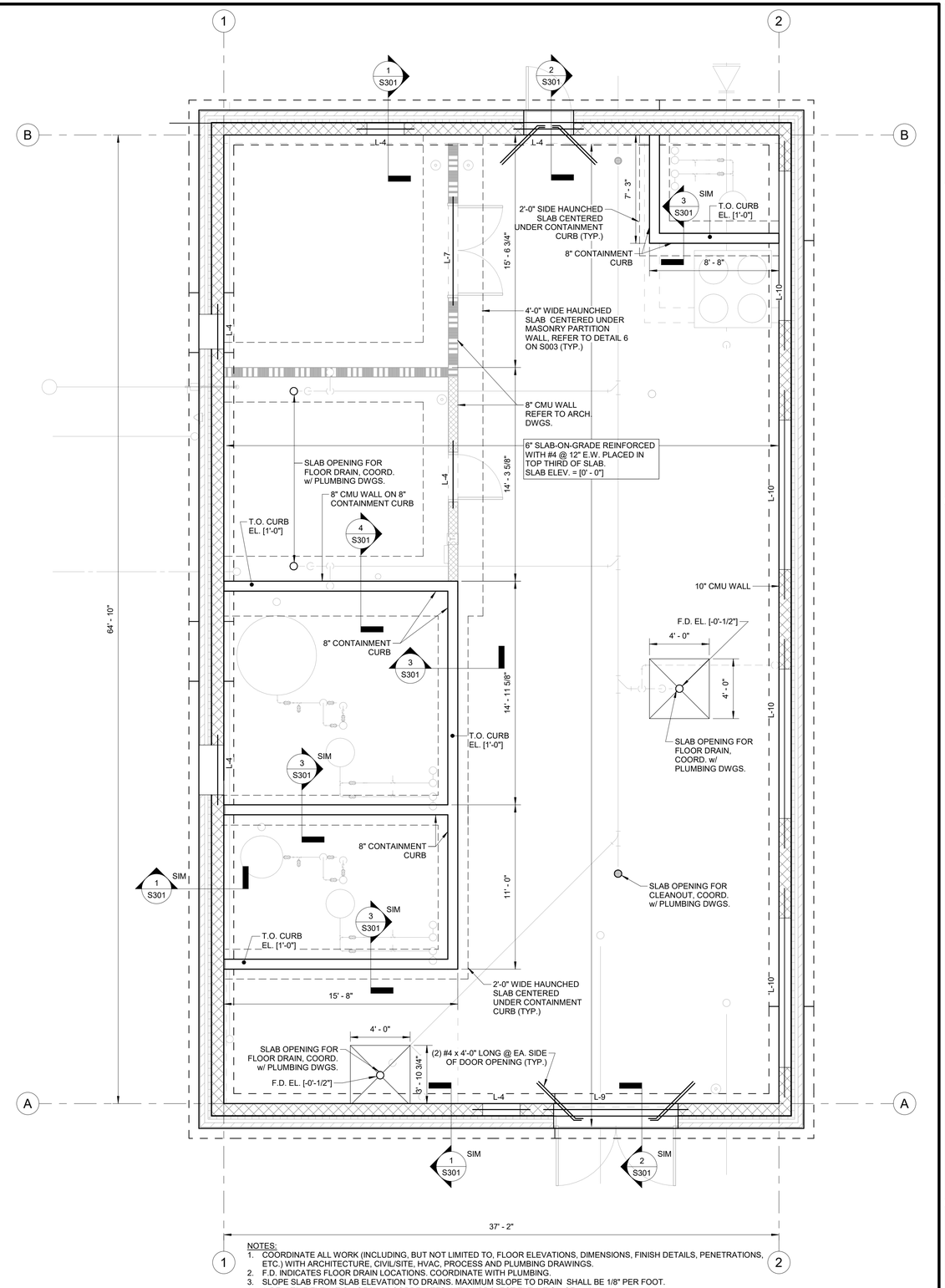


NOTES:
1. COORDINATE ALL WORK (INCLUDING, BUT NOT LIMITED TO, FLOOR ELEVATIONS, DIMENSIONS, FINISH DETAILS, STEP FOOTINGS, PENETRATIONS, ETC) WITH THE ARCHITECTURAL, SITE, PROCESS, PLUMBING, ELECTRICAL AND MECHANICAL DRAWINGS.
2. [XX'-XX"] INDICATES BOTTOM OF FOOTING ELEVATION. ALL EXTERIOR FOOTINGS SHALL BE LOCATED A MINIMUM OF 4'-0" BELOW FINISHED GRADE.
3. A RELATIVE ELEVATION OF [0'-0"] CORRELATES WITH A PROJECT ELEVATION OF 55.6'.

1 FOUNDATION PLAN

SCALE: 1/4" = 1'-0"


1
2
1 S301
2 S301
B
A
L-4
L-7
L-10
L-9
64' - 10"
15' - 6 3/4"
14' - 3 5/8"
14' - 11 5/8"
11' - 0"
7' - 3"
2'-0" SIDE HAUNCHED SLAB CENTERED UNDER CONTAINMENT CURB (TYP.)
8" CONTAINMENT CURB
3 S301
T.O. CURB EL. [1'-0"]
8' - 8"
4'-0" WIDE HAUNCHED SLAB CENTERED UNDER MASONRY PARTITION WALL, REFER TO DETAIL 6 ON S003 (TYP.)
8" CMU WALL REFER TO ARCH. DWGS.
6" SLAB-ON-GRADE REINFORCED WITH #4 @ 12" E.W. PLACED IN TOP THIRD OF SLAB. SLAB ELEV. = [0' - 0"]
SLAB OPENING FOR FLOOR DRAIN, COORD. w/ PLUMBING DWGS.
8" CMU WALL ON 8" CONTAINMENT CURB
4 S301
10" CMU WALL
F.D. EL. [-0'-1/2"]
4' - 0"
SLAB OPENING FOR CLEANOUT, COORD. w/ PLUMBING DWGS.
SIM
15' - 8"
2'-0" WIDE HAUNCHED SLAB CENTERED UNDER CONTAINMENT CURB (TYP.)
SLAB OPENING FOR FLOOR DRAIN, COORD. w/ PLUMBING DWGS.
F.D. EL. [-0'-1/2"]
3' - 10 3/4"
(2) #4 x 4'-0" LONG @ EA. SIDE OF DOOR OPENING (TYP.)
37' - 2"

NOTES:
1. COORDINATE ALL WORK (INCLUDING, BUT NOT LIMITED TO, FLOOR ELEVATIONS, DIMENSIONS, FINISH DETAILS, PENETRATIONS, ETC.) WITH ARCHITECTURE, CIVIL/SITE, HVAC, PROCESS AND PLUMBING DRAWINGS.
2. F.D. INDICATES FLOOR DRAIN LOCATIONS. COORDINATE WITH PLUMBING.
3. SLOPE SLAB FROM SLAB ELEVATION TO DRAINS. MAXIMUM SLOPE TO DRAIN SHALL BE 1/8" PER FOOT.
4. A RELATIVE ELEVATION OF [0'-0"] CORRELATES WITH A PROJECT ELEVATION OF 55.6'.
5. COORDINATE MASONRY WALL LOCATIONS AND WALL OPENINGS (DOORS, VENTS, WINDOWS, ETC.) WITH ARCHITECTURE AND MEP DRAWINGS.
6. LOCATIONS OF CONSTRUCTION JOINTS AND SAW JOINTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. REFER TO GENERAL NOTES FOR SPACING REQUIREMENTS. SUBMIT JOINT LOCATIONS TO THE ENGINEER FOR APPROVAL. REFER TO S003 FOR TYPICAL DETAILS.
7. COORDINATE ALL NON-STRUCTURAL WALLS WITH ARCHITECTURE FOR WALL TYPE AND LOCATIONS.
8. L-# INDICATES CONCRETE MASONRY UNIT (CMU) LINTEL TYPE. REFER TO CMU LINTEL SCHEDULE ON S003 FOR LINTEL INFORMATION.

2 SLAB AND WALL FRAMING PLAN

SCALE: 1/4" = 1'-0"

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Drawing Title:
FOUNDATION AND SLAB PLANS

Sheet Number:
S101

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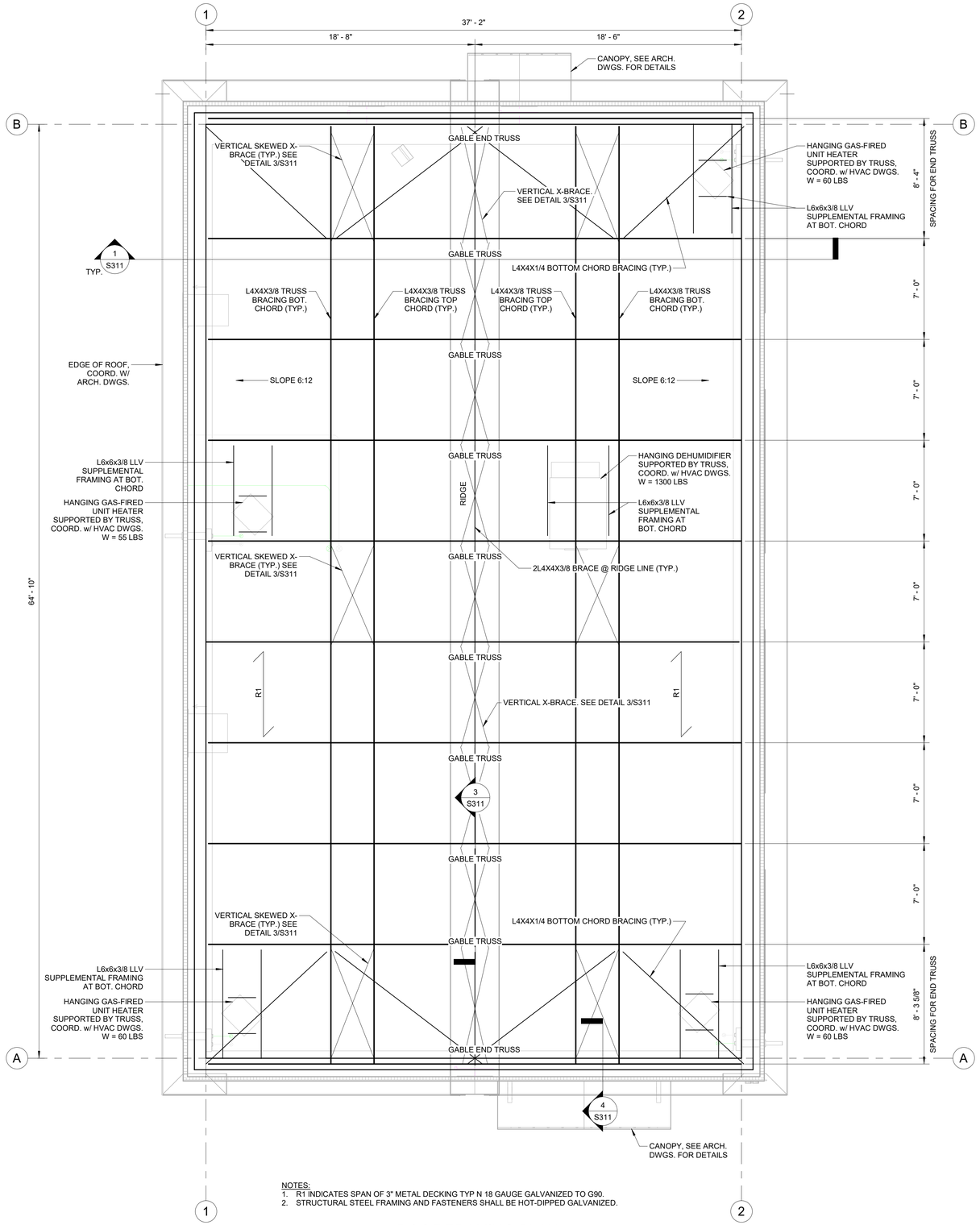
1
2
37' - 2"
18' - 8"
18' - 6"
CANOPY, SEE ARCH. DWGS. FOR DETAILS
B
A
GABLE END TRUSS
VERTICAL SKEWED X-BRACE (TYP.) SEE DETAIL 3/S311
VERTICAL X-BRACE. SEE DETAIL 3/S311
HANGING GAS-FIRED UNIT HEATER SUPPORTED BY TRUSS, COORD. w/ HVAC DWGS. W = 60 LBS
L6x6x3/8 LLV SUPPLEMENTAL FRAMING AT BOT. CHORD
8' - 4" SPACING FOR END TRUSS
GABLE TRUSS
1 S311 TYP.
L4X4X1/4 BOTTOM CHORD BRACING (TYP.)
L4X4X3/8 TRUSS BRACING BOT. CHORD (TYP.)
L4X4X3/8 TRUSS BRACING TOP CHORD (TYP.)
7' - 0"
EDGE OF ROOF, COORD. W/ ARCH. DWGS.
SLOPE 6:12
RIDGE
HANGING DEHUMIDIFIER SUPPORTED BY TRUSS, COORD. w/ HVAC DWGS. W = 1300 LBS
HANGING GAS-FIRED UNIT HEATER SUPPORTED BY TRUSS, COORD. w/ HVAC DWGS. W = 55 LBS
2L4X4X3/8 BRACE @ RIDGE LINE (TYP.)
64' - 10"
R1
3 S311
VERTICAL SKEWED X-BRACE (TYP.) SEE DETAIL 3/S311
8' - 3 5/8" SPACING FOR END TRUSS
4 S311
CANOPY, SEE ARCH. DWGS. FOR DETAILS

NOTES:
1. R1 INDICATES SPAN OF 3" METAL DECKING TYP N 18 GAUGE GALVANIZED TO G90.
2. STRUCTURAL STEEL FRAMING AND FASTENERS SHALL BE HOT-DIPPED GALVANIZED.

1 ROOF FRAMING PLAN

SCALE: 1/4" = 1'-0"

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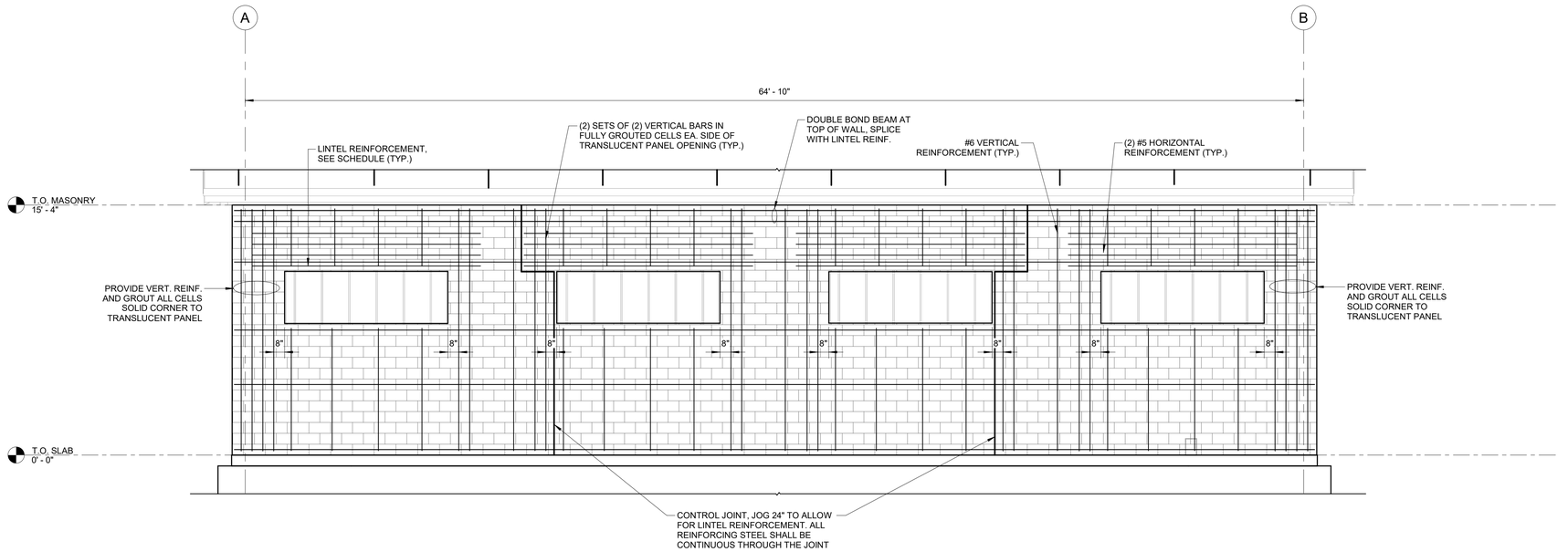
Drawing Title:
ROOF FRAMING PLAN

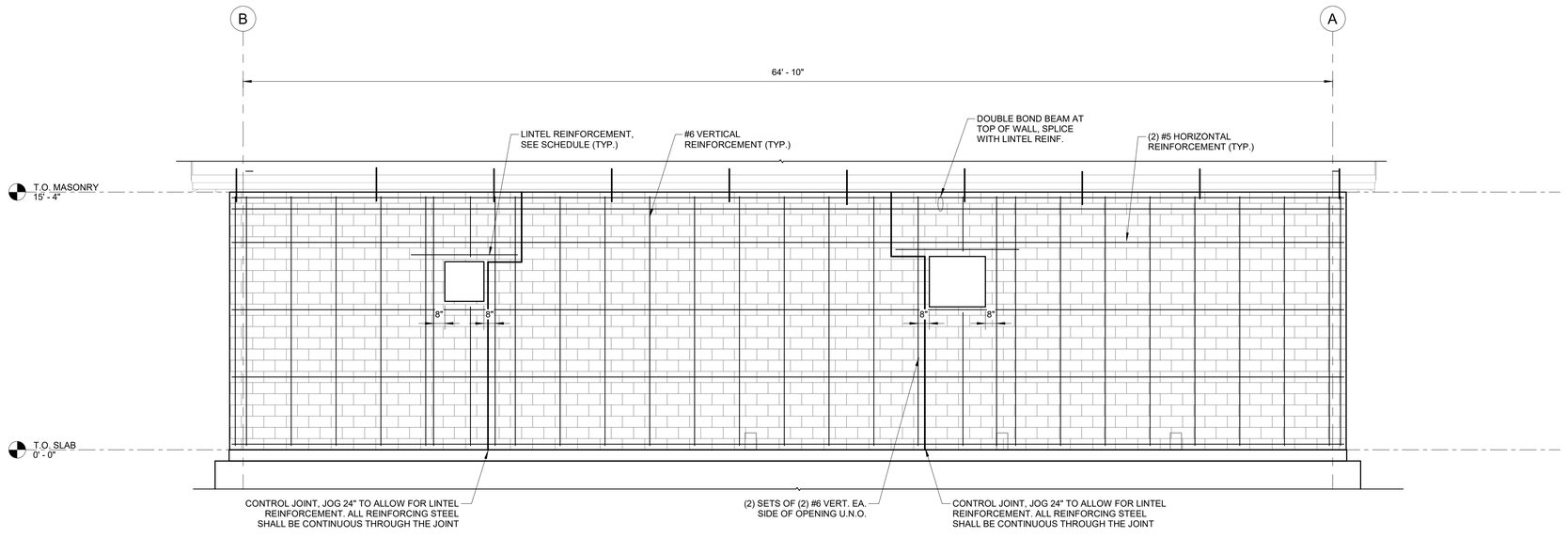
Sheet Number:
S121


A
B
64' - 10"
LINTEL REINFORCEMENT, SEE SCHEDULE (TYP.)
(2) SETS OF (2) VERTICAL BARS IN FULLY GROUTED CELLS EA. SIDE OF TRANSLUCENT PANEL OPENING (TYP.)
DOUBLE BOND BEAM AT TOP OF WALL, SPLICE WITH LINTEL REINF.
#6 VERTICAL REINFORCEMENT (TYP.)
(2) #5 HORIZONTAL REINFORCEMENT (TYP.)
T.O. MASONRY 15' - 4"
PROVIDE VERT. REINF. AND GROUT ALL CELLS SOLID CORNER TO TRANSLUCENT PANEL
PROVIDE VERT. REINF. AND GROUT ALL CELLS SOLID CORNER TO TRANSLUCENT PANEL
8"
T.O. SLAB 0' - 0"
CONTROL JOINT, JOG 24" TO ALLOW FOR LINTEL REINFORCEMENT. ALL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH THE JOINT

NOTES:
1. COORDINATE MASONRY WALL OPENINGS (DOORS, VENTS, WINDOWS, ETC.) WITH ARCHITECTURE AND MEP DRAWINGS.
2. REFER TO SLAB PLAN AND CMU LINTEL SCHEDULE FOR LINTEL SIZE AND REINFORCING DETAILS.

1 EAST ELEVATION

SCALE: 1/4" = 1'-0"


B
A
64' - 10"
LINTEL REINFORCEMENT, SEE SCHEDULE (TYP.)
#6 VERTICAL REINFORCEMENT (TYP.)
DOUBLE BOND BEAM AT TOP OF WALL, SPLICE WITH LINTEL REINF.
(2) #5 HORIZONTAL REINFORCEMENT (TYP.)
T.O. MASONRY 15' - 4"
8"
T.O. SLAB 0' - 0"
CONTROL JOINT, JOG 24" TO ALLOW FOR LINTEL REINFORCEMENT. ALL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH THE JOINT
(2) SETS OF (2) #6 VERT. EA. SIDE OF OPENING U.N.O.
CONTROL JOINT, JOG 24" TO ALLOW FOR LINTEL REINFORCEMENT. ALL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH THE JOINT

NOTES:
1. COORDINATE MASONRY WALL OPENINGS (DOORS, VENTS, WINDOWS, ETC.) WITH ARCHITECTURE AND MEP DRAWINGS.
2. REFER TO SLAB PLAN AND CMU LINTEL SCHEDULE FOR LINTEL SIZE AND REINFORCING DETAILS.

2 WEST ELEVATION

SCALE: 1/4" = 1'-0"

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Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD CHATHAM, MA 02633

WELLS 10 AND 11 PUMPING AND TREATMENT DESIGN
MILL HILL ROAD CHATHAM, MA 02633

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Consultants:

Revisions:

No.	Date	Description

COA:

Seal:
COMMONWEALTH OF MASSACHUSETTS
NATHAN M. SEIFERT STRUCTURAL No. 41693 REGISTERED PROFESSIONAL ENGINEER
3/30/2022

Issued For:
BID

Scale: NTS = 1'-0"

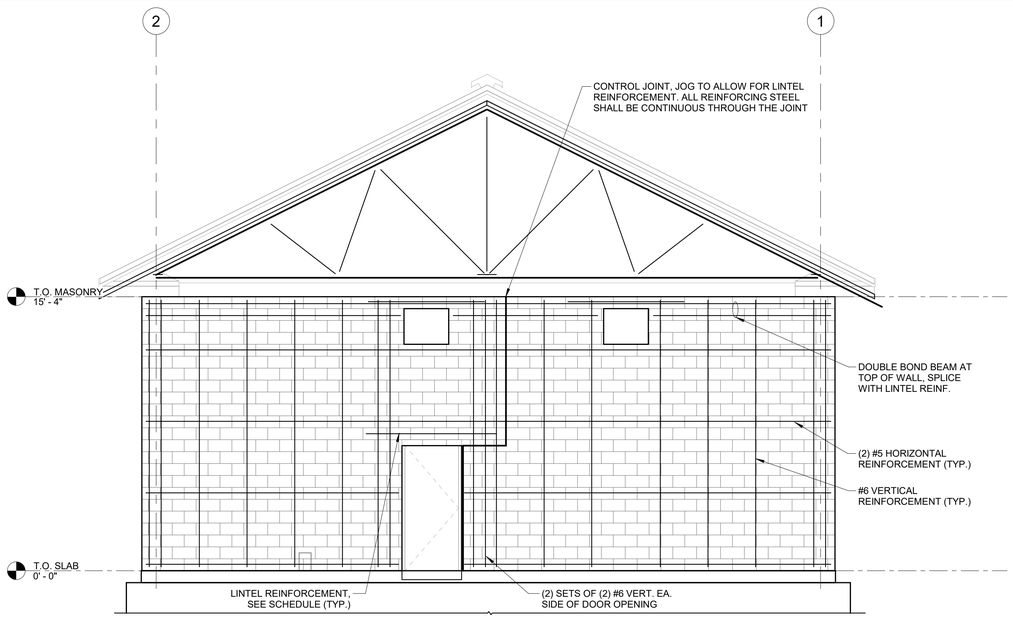
Key Plan:

NORTH

Date:	MARCH 30, 2022
Drawn By:	EAS
Reviewed By:	EP
Approved By:	NMS
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
ELEVATIONS I

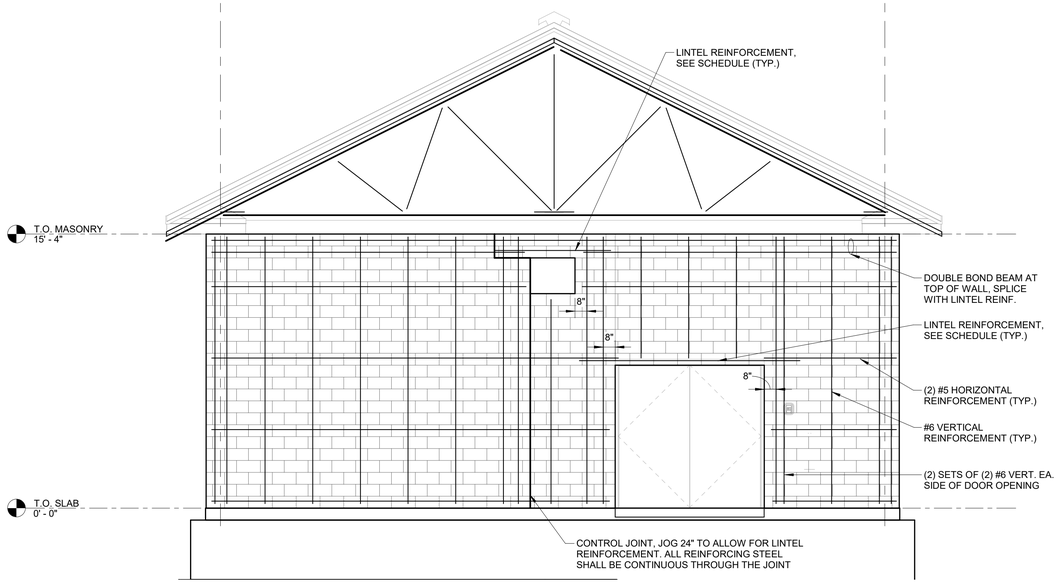
Sheet Number:
S201


2
1
CONTROL JOINT, JOG TO ALLOW FOR LINTEL REINFORCEMENT. ALL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH THE JOINT
T.O. MASONRY
15' - 4"
DOUBLE BOND BEAM AT TOP OF WALL, SPLICE WITH LINTEL REINF.
(2) #5 HORIZONTAL REINFORCEMENT (TYP.)
#6 VERTICAL REINFORCEMENT (TYP.)
T.O. SLAB
0' - 0"
LINTEL REINFORCEMENT, SEE SCHEDULE (TYP.)
(2) SETS OF (2) #6 VERT. EA. SIDE OF DOOR OPENING

NOTES:
1. COORDINATE MASONRY WALL OPENINGS (DOORS, VENTS, WINDOWS, ETC.) WITH ARCHITECTURE AND MEP DRAWINGS.
2. REFER TO SLAB PLAN AND CMU LINTEL SCHEDULE FOR LINTEL SIZE AND REINFORCING DETAILS.

1 NORTH ELEVATION

SCALE: 1/4" = 1'-0"


1
2
LINTEL REINFORCEMENT, SEE SCHEDULE (TYP.)
T.O. MASONRY
15' - 4"
DOUBLE BOND BEAM AT TOP OF WALL, SPLICE WITH LINTEL REINF.
8"
8"
8"
LINTEL REINFORCEMENT, SEE SCHEDULE (TYP.)
(2) #5 HORIZONTAL REINFORCEMENT (TYP.)
#6 VERTICAL REINFORCEMENT (TYP.)
(2) SETS OF (2) #6 VERT. EA. SIDE OF DOOR OPENING
T.O. SLAB
0' - 0"
CONTROL JOINT, JOG 24" TO ALLOW FOR LINTEL REINFORCEMENT. ALL REINFORCING STEEL SHALL BE CONTINUOUS THROUGH THE JOINT

NOTES:
1. COORDINATE MASONRY WALL OPENINGS (DOORS, VENTS, WINDOWS, ETC.) WITH ARCHITECTURE AND MEP DRAWINGS.
2. REFER TO SLAB PLAN AND CMU LINTEL SCHEDULE FOR LINTEL SIZE AND REINFORCING DETAILS.

2 SOUTH ELEVATION

SCALE: 1/4" = 1'-0"

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Scale: NTS = 1'-0"

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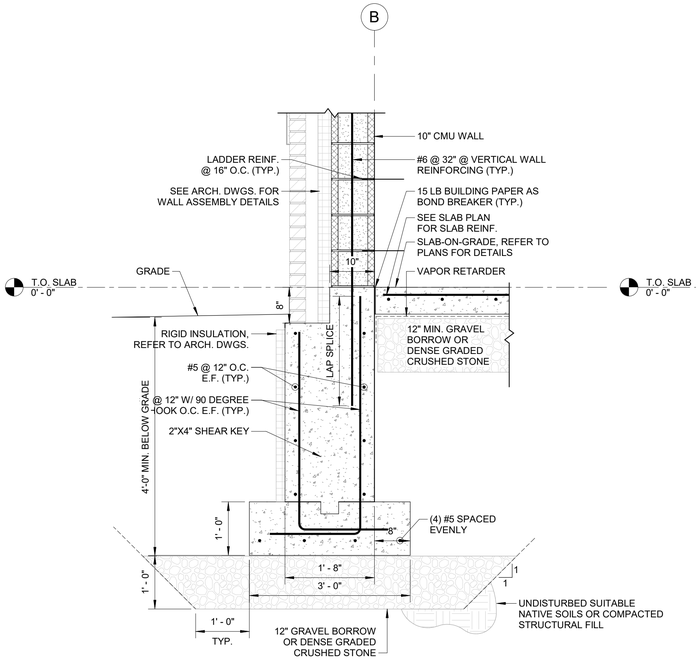
Drawn By:	EAS
Reviewed By:	EP
Approved By:	NMS
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

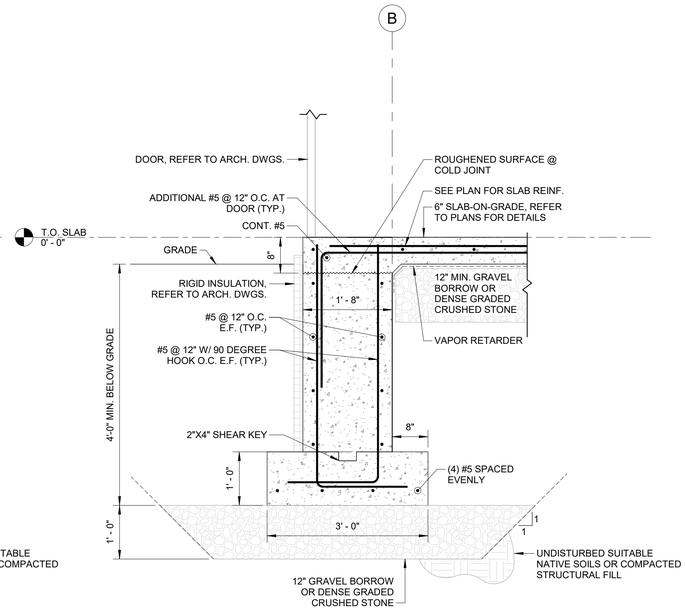
Drawing Title:
ELEVATIONS II

Sheet Number:
S202


B
10" CMU WALL
LADDER REINF. @ 16" O.C. (TYP.)
#6 @ 32" @ VERTICAL WALL REINFORCING (TYP.)
SEE ARCH. DWGS. FOR WALL ASSEMBLY DETAILS
15 LB BUILDING PAPER AS BOND BREAKER (TYP.)
SEE SLAB PLAN FOR SLAB REINF.
SLAB-ON-GRADE, REFER TO PLANS FOR DETAILS
10"
VAPOR RETARDER
T.O. SLAB 0' - 0"
GRADE
8"
RIGID INSULATION, REFER TO ARCH. DWGS.
LAP SPLICE
12" MIN. GRAVEL BORROW OR DENSE GRADED CRUSHED STONE
#5 @ 12" O.C. E.F. (TYP.)
#5 @ 12" W/ 90 DEGREE HOOK O.C. E.F. (TYP.)
4'-0" MIN. BELOW GRADE
2"X4" SHEAR KEY
1' - 0"
8"
(4) #5 SPACED EVENLY
1' - 8"
3' - 0"
1
1
1' - 0"
1' - 0" TYP.
UNDISTURBED SUITABLE NATIVE SOILS OR COMPACTED STRUCTURAL FILL
12" GRAVEL BORROW OR DENSE GRADED CRUSHED STONE

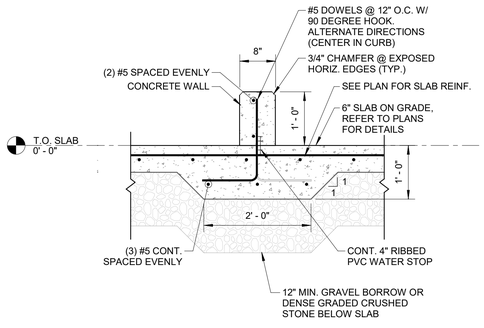
1 TYPICAL SECTION @ FOUNDATION WALL

SCALE: 3/4" = 1'-0"


B
DOOR, REFER TO ARCH. DWGS.
ROUGHENED SURFACE @ COLD JOINT
ADDITIONAL #5 @ 12" O.C. AT DOOR (TYP.)
SEE PLAN FOR SLAB REINF.
6" SLAB-ON-GRADE, REFER TO PLANS FOR DETAILS
CONT. #5
T.O. SLAB 0' - 0"
GRADE
8"
RIGID INSULATION, REFER TO ARCH. DWGS.
1' - 8"
12" MIN. GRAVEL BORROW OR DENSE GRADED CRUSHED STONE
#5 @ 12" O.C. E.F. (TYP.)
#5 @ 12" W/ 90 DEGREE HOOK O.C. E.F. (TYP.)
VAPOR RETARDER
4'-0" MIN. BELOW GRADE
2"X4" SHEAR KEY
8"
1' - 0"
(4) #5 SPACED EVENLY
1' - 0"
3' - 0"
1
1
UNDISTURBED SUITABLE NATIVE SOILS OR COMPACTED STRUCTURAL FILL
12" GRAVEL BORROW OR DENSE GRADED CRUSHED STONE

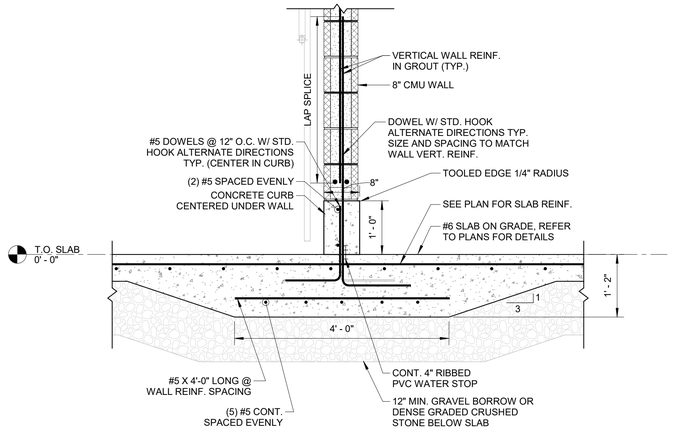
2 FOUNDATION SECTION @ DOOR

SCALE: 3/4" = 1'-0"


#5 DOWELS @ 12" O.C. W/ 90 DEGREE HOOK, ALTERNATE DIRECTIONS (CENTER IN CURB)
8"
3/4" CHAMFER @ EXPOSED HORIZ. EDGES (TYP.)
(2) #5 SPACED EVENLY
CONCRETE WALL
SEE PLAN FOR SLAB REINF.
1' - 0"
6" SLAB ON GRADE, REFER TO PLANS FOR DETAILS
T.O. SLAB 0' - 0"
1
1
1' - 0"
2' - 0"
(3) #5 CONT. SPACED EVENLY
CONT. 4" RIBBED PVC WATER STOP
12" MIN. GRAVEL BORROW OR DENSE GRADED CRUSHED STONE BELOW SLAB

3 SECTION @ CONTAINMENT CURB

SCALE: 3/4" = 1'-0"


VERTICAL WALL REINF. IN GROUT (TYP.)
8" CMU WALL
LAP SPLICE
DOWEL W/ STD. HOOK ALTERNATE DIRECTIONS TYP. SIZE AND SPACING TO MATCH WALL VERT. REINF.
#5 DOWELS @ 12" O.C. W/ STD. HOOK ALTERNATE DIRECTIONS TYP. (CENTER IN CURB)
(2) #5 SPACED EVENLY
8"
TOOLED EDGE 1/4" RADIUS
CONCRETE CURB CENTERED UNDER WALL
SEE PLAN FOR SLAB REINF.
1' - 0"
#6 SLAB ON GRADE, REFER TO PLANS FOR DETAILS
T.O. SLAB 0' - 0"
1
3
1' - 2"
4' - 0"
#5 X 4'-0" LONG @ WALL REINF. SPACING
(5) #5 CONT. SPACED EVENLY
CONT. 4" RIBBED PVC WATER STOP
12" MIN. GRAVEL BORROW OR DENSE GRADED CRUSHED STONE BELOW SLAB

4 SECTION @ INTERIOR WALL ON CONTAINMENT CURB

SCALE: 3/4" = 1'-0"

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NATHAN M. SEIPERT
STRUCTURAL
No. 41693
REGISTERED
PROFESSIONAL ENGINEER
3/30/2022

Issued For:
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Scale: 3/4" = 1'-0"

Key Plan:

NORTH

Date:	MARCH 30, 2022
Drawn By:	AAC
Reviewed By:	EJP
Approved By:	NMS
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:

FOUNDATION SECTIONS & DETAILS

Sheet Number:

S301

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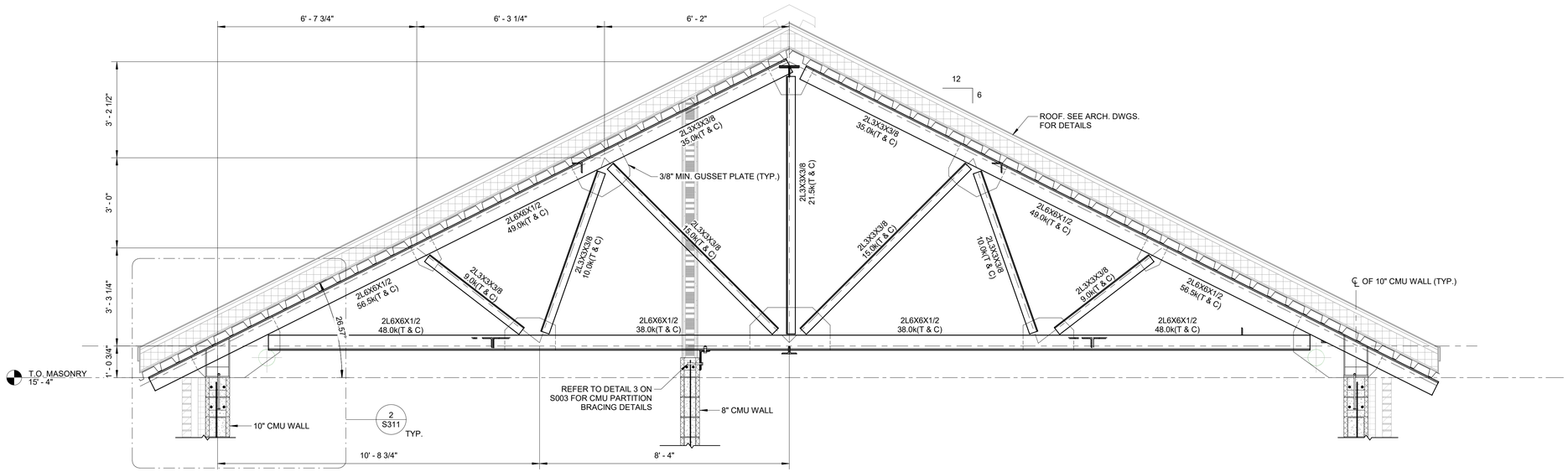
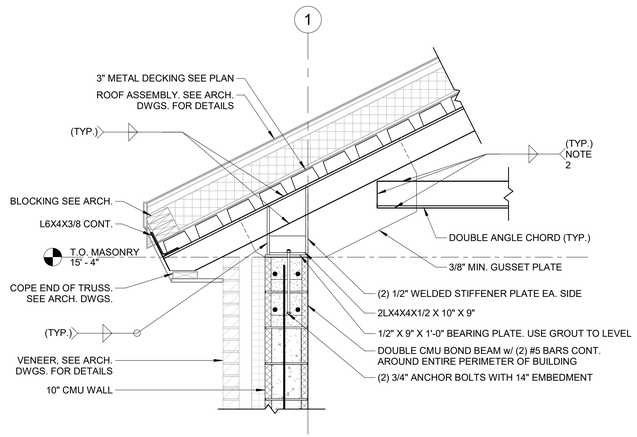


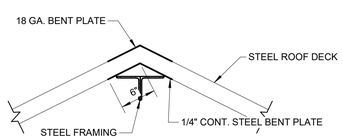
NOTES:
1. ALL STRUCTURAL STEEL AND PLATES SHALL BE HOT-DIPPED GALVANIZED PER ASTM A123. ALL FASTENERS SHALL BE HOT-DIPPED GALVANIZED PER ASTM A153.
2. WORKING LINES ARE AT NEUTRAL AXIS OF ANGLE ELEMENTS.
3. TRUSS IS SYMMETRICAL.
4. POSTED TENSION (T) AND COMPRESSION (C) LOADS ARE MAXIMUM ASD FACTORED DESIGN LOADS

1 TRUSS ELEVATION
SCALE: 1/2" = 1'-0"

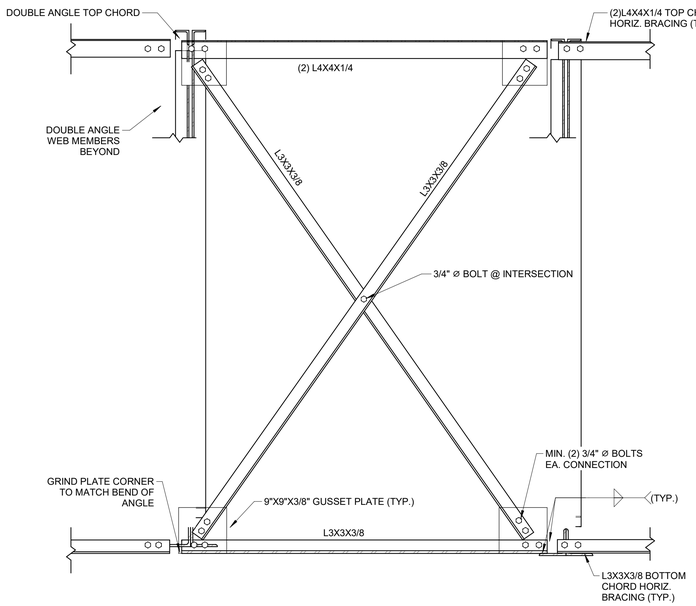

1
3" METAL DECKING SEE PLAN
ROOF ASSEMBLY. SEE ARCH. DWGS. FOR DETAILS
(TYP.)
(TYP.) NOTE 2
BLOCKING SEE ARCH.
L6X4X3/8 CONT.
T.O. MASONRY 15' - 4"
COPE END OF TRUSS. SEE ARCH. DWGS.
DOUBLE ANGLE CHORD (TYP.)
3/8" MIN. GUSSET PLATE
(2) 1/2" WELDED STIFFENER PLATE EA. SIDE
2LX4X4X1/2 X 10" X 9"
1/2" X 9" X 1'-0" BEARING PLATE. USE GROUT TO LEVEL
DOUBLE CMU BOND BEAM w/ (2) #5 BARS CONT. AROUND ENTIRE PERIMETER OF BUILDING
(2) 3/4" ANCHOR BOLTS WITH 14" EMBEDMENT
VENEER, SEE ARCH. DWGS. FOR DETAILS
10" CMU WALL

NOTES:
1. ALL STRUCTURAL STEEL AND PLATES SHALL BE HOT-DIPPED GALVANIZED PER ASTM A123. ALL FASTENERS SHALL BE HOT-DIPPED GALVANIZED PER ASTM A153.
2. CONNECTION ENGINEER TO DESIGN WELDS TO DEVELOP LOADS POSTED

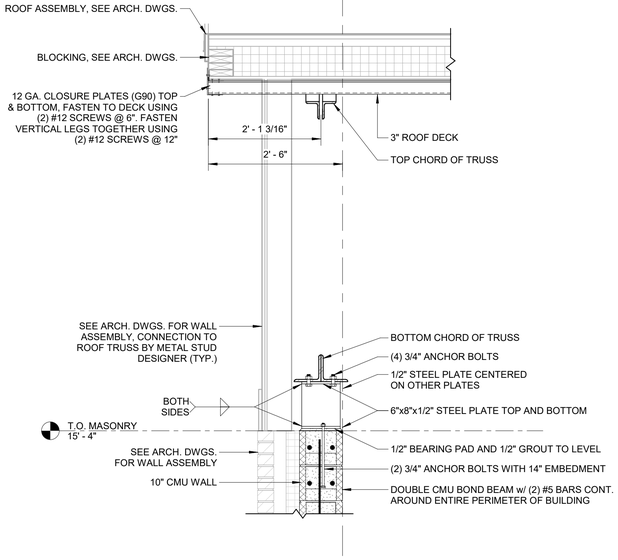
2 TRUSS BEARING ON CMU WALL
SCALE: 3/4" = 1'-0"



5 TYPICAL DETAIL AT STRUCTURAL SUPPORT RIDGES
SCALE: 1" = 1'-0"



3 "X-BRACE" DETAIL
SCALE: 3/4" = 1'-0"


A
ROOF ASSEMBLY, SEE ARCH. DWGS.
BLOCKING, SEE ARCH. DWGS.
12 GA. CLOSURE PLATES (G90) TOP & BOTTOM, FASTEN TO DECK USING (2) #12 SCREWS @ 6". FASTEN VERTICAL LEGS TOGETHER USING (2) #12 SCREWS @ 12"
2' - 1 3/16"
2' - 6"
3" ROOF DECK
TOP CHORD OF TRUSS
SEE ARCH. DWGS. FOR WALL ASSEMBLY, CONNECTION TO ROOF TRUSS BY METAL STUD DESIGNER (TYP.)
BOTTOM CHORD OF TRUSS
(4) 3/4" ANCHOR BOLTS
1/2" STEEL PLATE CENTERED ON OTHER PLATES
BOTH SIDES
6"x8"x1/2" STEEL PLATE TOP AND BOTTOM
T.O. MASONRY 15' - 4"
1/2" BEARING PAD AND 1/2" GROUT TO LEVEL
SEE ARCH. DWGS. FOR WALL ASSEMBLY
(2) 3/4" ANCHOR BOLTS WITH 14" EMBEDMENT
10" CMU WALL
DOUBLE CMU BOND BEAM w/ (2) #5 BARS CONT. AROUND ENTIRE PERIMETER OF BUILDING

4 SECTION AT GABLE END
SCALE: 3/4" = 1'-0"

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Key Plan:

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Date:	MARCH 30, 2022
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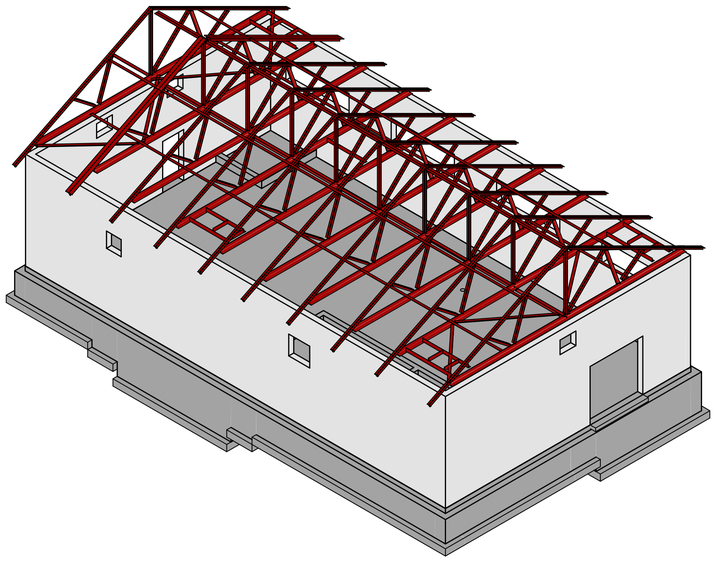
Reviewed By:	AAC
Approved By:	NMS
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

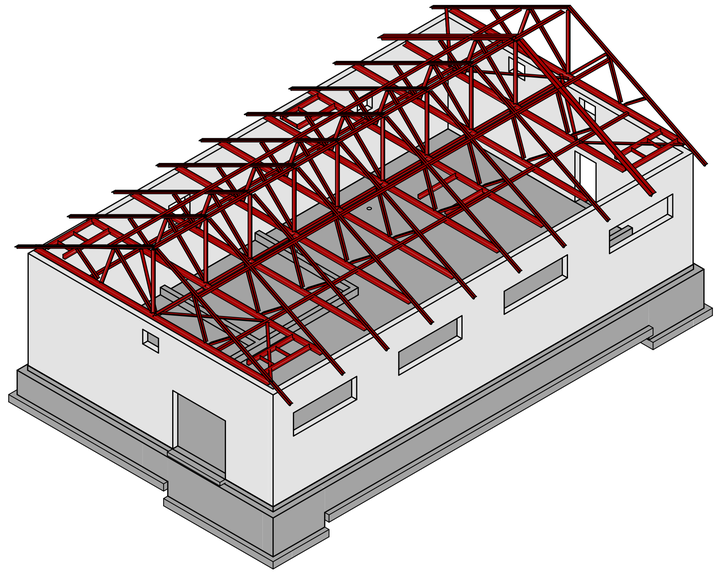
Drawing Title:
STEEL SECTIONS & DETAILS

Sheet Number:
S311



1 3D VIEW LOOKING NORTHEAST

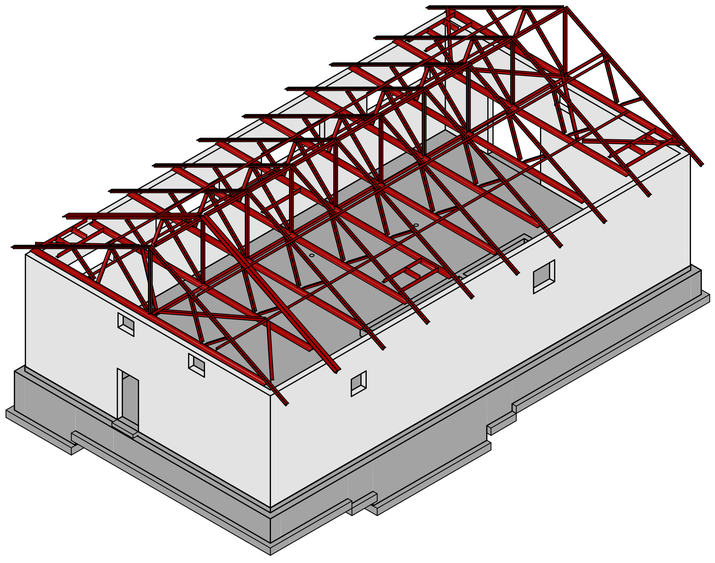
SCALE:



2 3D VIEW LOOKING NORTHWEST

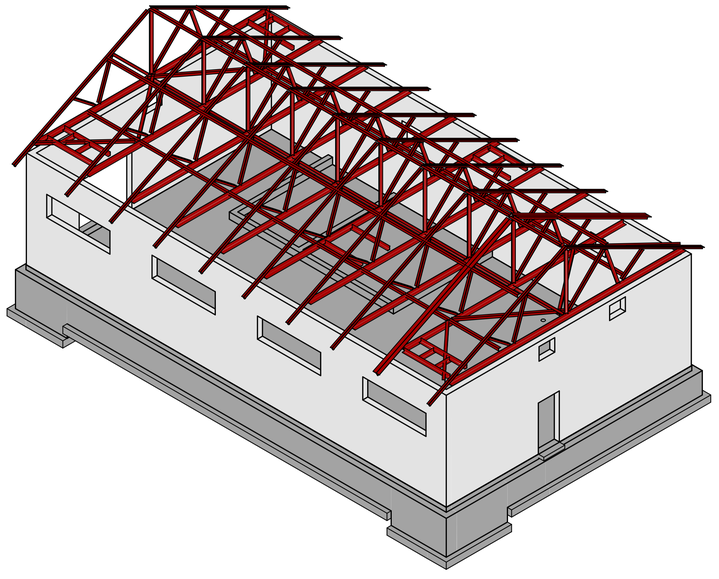
SCALE:

NOTES:
3D VIEWS ARE FOR REFERENCE ONLY.



3 3D VIEW LOOKING SOUTHEAST

SCALE:



4 3D VIEW LOOKING SOUTHWEST

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Reviewed By:	AAC
Approved By:	NMS
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
3D VIEWS

Sheet Number:
S901

PIPING AND VALVE SYMBOLS

- GATE VALVE
- GLOBE VALVE
- BALL VALVE
- BALL VALVE (TRUE UNION)
- CHECK VALVE
- TWIN DISC CHECK VALVE
- CUSHIONED SWING CHECK VALVE
- BUTTERFLY VALVE
- PLUG VALVE
- CONE VALVE
- DIAPHRAGM
- ANGLE VALVE
- THREE WAY VALVE
- FOUR WAY VALVE
- PRESSURE REDUCING VALVE
- BACKFLOW PREVENTER
- SOLENOID OPERATED VALVE
- BACK PRESSURE VALVE
- PRESSURE RELIEF OR SAFETY VALVE
- AIR RELEASE VALVE
- KNIFE GATE VALVE
- NEEDLE VALVE
- ROTARY VALVE
- FOOT VALVE
- POST INDICATING VALVE
- PINCH VALVE
- DIAPHRAM WEIR VALVE
- PNEUMATIC DIAPHRAGM OPERATED VALVE
- CYLINDER OPERATED VALVE
- ELECTRIC MOTOR OPERATED VALVE
- FLOAT VALVE
- PRESSURE CONTROL VALVE (PCV)
- TEMPERATURE CONTROL VALVE (TCV)
- AUTOMATIC AIR VENT (AAV)
- MANUAL AIR VENT (MAV)
- THERMOWELL
- WEIR GATE (WG)
- SLIDE GATE (SG)
- SLUICE GATE (SLG)
- TELESCOPING VALVE (TV)
- STEAM TRAP
- MANUAL VOLUME DAMPER
- ACTUATED VOLUME DAMPER
- FLEXIBLE CONNECTION
- EXPANSION JOINT

- PIPE GUIDE
- PIPE ANCHOR
- REDUCER
- UNION
- WYE STRAINER
- BASKET STRAINER
- COUPLING (TRANSITION)
- QUICK COUPLING
- CALIBRATION CHAMBER
- WATER HAMMER ARRESTOR
- ROTAMETER
- PULSATION DAMPER
- EDUCTOR
- INJECTOR
- STATIC METER
- MIXER
- V-NOTCH WEIR
- DRAIN
- DIAPHRAGM OR LOAD CELL
- AIR SET
- INSERTION INSTRUMENT
- AUTOMATIC CONDENSATE TRAP
- PRESS/VAC RELIEF VALVE w/o FLAME ARRESTOR
- PRESS/VAC RELIEF WITH FLAME ARRESTOR
- FLAME ARRESTOR WITH COVER
- FLAME ARRESTER
- SPACE HEATER/HEAT TRACING
- ELECTRIC MOTOR
- CAP
- RUPTURE DISK (ON PRESSURE)
- RUPTURE DISK (ON VACUUM)
- FLEXIBLE HOSE WITH QUICK COUPLINGS
- FLANGES
- PRESSURE INSTRUMENT PROTECTOR
- PARTICULATE FILTER
- DESSICANT DRYER
- SEPARATOR
- BASKET STRAINER
- ID LOOP — BUBBLER SYSTEM
- OPEN CHANNEL OR OPENINGS BETWEEN TANKS (NON-PIPED FLOW)
- PRESSURE RELIEF AND FLAME TRAP
- FLOAT LEVEL SWITCH

PUMP SYMBOLS

- CENTRIFUGAL PUMP (SHOWN WITH MOTOR)
- SPLIT CASE PUMP (SHOWN WITH MOTOR)
- GEAR PUMP (SHOWH WITH MOTOR)
- SUBMERSIBLE OR SUMP PUMP (SHOWN WITH MOTOR)
- METERING PUMP (SHOWN WITH MOTOR)
- PROGRESSIVE CAVITY PUMP (SHOWN WITH MOTOR)
- DIAPHRAGM PUMP (SHOWN WITH MOTOR)
- VERTICAL TURBINE PUMP (SHOWN WITH MOTOR)
- ROTARY LOBE PUMP (SHOWN WITH MOTOR)
- PISTON PUMP
- ROTOR PUMP
- HOSE PUMP

BLOWER/COMPRESSOR SYMBOLS

- CENTRIFUGAL BLOWER OR COMPRESSOR (SHOWN WITH MOTOR)
- PD BLOWER OR COMPRESSOR (SHOWN WITH MOTOR)

FLOW ELEMENT SYMBOLS

- VORTEX FLOW METER
- CORIOLIS FLOW METER
- PROPELLER FLOW METER
- ORIFICE PLATE
- PARSHALL FLUME
- MAGNETIC FLOW METER
- FLOW TUBE (VENTURI)
- DISC FLOW METER

AGITATOR SYMBOLS

- RADIAL
- PROPELLER
- TURBINE

LINE SYMBOLS

- PRIMARY PROCESS I INF
- SECONDARY PROCESS I INF
- EXISTING
- EXISTING TO BE REMOVED
- EXISTING TO BE ABANDONED
- FUTURE
- REDUCER
- PIPE SPEC CHANGE
- HYDRAULIC
- SHEET: LINE ONE / LINE TWO — SHEET CONTINUATION
- XX — CONTINUATION ELSEWHERE, SAME SHEET

EQUIPMENT SYMBOLS

NEW EQUIPMENT | EXIST. EQUIPMENT | FUTURE EQUIPMENT

EQUIPMENT/UNIT IDENTIFICATION

SYS-UD-UN
- UNIT NUMBER
- UNIT DESIGNATION (EQUIP. TYPE)
- SYSTEM IDENTIFICATION

PIPE LINE IDENTIFICATION

DT-SSSS-MOC
- MATERIAL OF CONSTRUCTION
- SERVICE IDENTIFICATION
- NOMINAL PIPE DIAMETER

HEAT TRACING IDENTIFICATION

HT-X-X___

ABBREVIATIONS

SYSTEM, PROCESS & SERVICE

ABSN	AERATION BASIN
AC	AIR COMPRESSOR
ADIG	ANAEROBIC DIGESTER
AER	AERATOR
AFCR	AFTER COOLER
AIR	AIR
AL	ALUM
AMM	AMMONIA
B	BURNER
BFP	BELT FILTER PRESS
BIOG	BIO-GAS
BL	BLOWER
BLR	BOILER
BM	BATCH METER
BRH	BLOWDOWN HEAT RECOVERY
BSN	BASIN
BT	BULK TANK
BW	BACKWASH
BWR	BACKWASH RETURN
BWS	BACKWASH SUPPLY
BYP	BYPASS
C	CARBON
CAB	CABINET
CAM	CAMERA
CAUS	CAUSTIC
CB	CORE BLOW
CD	CONDENSATE
CENT	CENTRIFUGE
CH	CONVERGING HOPPER
CHEM	CHEMICAL
CHWR	COOLING WATER RETURN
CHWS	COOLING WATER SUPPLY
CL	CHLORINE
CLA	CHEMICAL LOAD AREA
CLAR	CLARIFIER
CLAS	CLASSIFIER
CLDX	CHLORINE DIOXIDE
CLS	CHLORINE SOLUTION
CLTR	CHLORINATOR
COMP	COMPOST
CONC	CONCRETE
CONV	CONVEYOR
CORH	CORROSION INHIBITER
CRN	CRANE
CSCR	CHLORINE SCRUBBER
D	DRAIN
DAF	DISSOLVED AIR FLOTATION
DC	DUST COLLECTOR
DCL	DECHLORINATION
DCNT	DECANT
DER	DEAERATOR
DET	DETECTOR
DIG	DIGESTER
DRV	DRIVE
DRY	DRYER
DSL	DIGESTED SLUDGE
DT	DAY TANK
ED	EDUCTOR
EF	EXHAUST FAN
EFF	EFFLUENT
EJ	EJECTOR
ELSG	ELECTRIC SLUICE GATE
EMV	ELECTRIC MOTOR OPERATED VALVE
EQ	EQUALIZATION
EV	ELECTRICALLY OPERATED VALVE
FC	FAILED CLOSED
FCL	FINAL CLARIFIER
FCP	FIELD CONTROL PANEL
FDR	FEEDER
FIL	FILTRATE/FILTER
FIL(X)	FILTER
FIN	FINAL
FL	FAIL LOCKED
FMX	FLASH MIX
FO	FAILED OPEN
FOR	FUEL OIL RETURN
FOS	FUEL OIL SUPPLY
FOT	FUEL OIL TANK
FP	FILTER PRESS
GBT	GRAVITY BELT THICKENER
GR	GRIT
GRC	GRIT CHAMBER
GRND	GRINDER
HG	HAND GATE
HPS	HIGH PRESSURE STEAM
HPW	HIGH PRESSURE WATER
HSG	HYDRAULIC SLUICE GATE
HST	HOIST
HT	HEAT TRACE
HV	HYDRAULIC VALVE
HWR	HEATED WATER RETURN
HWS	HEATED WATER SUPPLY
IA	INSTRUMENT AIR
INF	INFLUENT
INT	INTERMEDIATE
IT	INSULATE & HEAT TRACE
KMn04	POTASSIUM PERMANGANATE
KOH	POTASSIUM HYDOXIDE
LA	LAND APPLICATION
LC	LEVEL CONTROL
LCP	LOCAL CONTROL PANEL
LI	LIME
LOX	LIQUID OXYGEN
LPG	LP GAS
LPS	LOW PRESSURE STEAM
LPY	LIQUID POLYMER
MCP	MAIN CONTROL PANEL
ME	MECHANICAL EQUIPMENT
MECH	MECHANISM
MH	METHANE
ML	MIXED LIQUOR
MP	METERING PUMP
MV	METERING VAULT
MOV	MOTOR OPERATED VALVE
MX	MIXER
NC	NORMALLY CLOSED
NEU	NEUTRALIZATION
NG	NATURAL GAS
NO	NORMALLY OPEN
NOZ	NOZZLE
NPW	NON-POTABLE WATER
NPY	NEAT POLYMER
NU	NUTRIENT
O/W	OIL WATER SEPARATOR
OC	ODOR CONTROL
OD	OXIDATION DITCH
OF	OVERFLOW
OG	OFF GAS
OZ	OZONE
P	PUMP
PA	POST AERATION
PBU	POWER BACKUP
PCL	PRIMARLY CLARIFIER
PD	PROCESS DRAIN
PE	PROCESS EQUIPMENT
PF	PARSHALL FLUME
PG	PIPE GALLERY
PI	PRIMARY INFLUENT
PL	PROCESS LIQUID
PNL	PANEL
PSL	PRIMARY SLUDGE
PW	POTABLE WATER
PY	POLYMER
RAS	RETURN ACTIVATED SLUDGE
RP	RECIRCULATING PUMP
RO	RECOVERED OIL
REC	RECYCLE
RM	ROTAMETER
SA	SULFURIC ACID
SAM	SAMPLE
SAMP	SAMPLER
SBS	SODIUM BISULFITE
SC	SCUM
SCLE	SCALE
SCL	SECONDARY CLARIFIER
SCLR	SODIUM CHLORITE
SCR	SCRUBBER
SCRN	SCREEN
SCRS	SCREENED SOLIDS
SD	STORM DRAIN
SEAL	SEAL WATER
SEP	SEPARATOR
SET	SETTLING
SF	SUPPLY FAN
SG	SLIDE GATE
SH	SODIUM HYDROXIDE
SHCLR	SODIUM HYPOCHLORITE
SHT	SLUDGE HOLDING TANK
SL	SLUDGE
SLG	SLUICE GATE
SMP	SUMP
SMX	STATIC MIXER
SOLN	SOLUTION
SP	SCREENINGS PRESS
SPL	SPLITTER BOX
SS	SANITARY SEWER
STG	STAGE
STRN	STRAINER
SV	SOLENOID VALVE
SYS	SYSTEM
T	TANK
TCV	TEMPERATURE CONTROL VALVE
THDSL	THICKENED DIGESTED SLUDGE
THK	THICKENER
THWAS	THICKENED WASTE ACTIVATED SLUDGE
UD	UNDERDRAIN
UW	UTILITY WATER
V	VALVE
VACR	VACUUM REGULATOR
VAS	VACUUM AUTO SWITCHOVER
VCP	VALVE CONTROL PANEL
VNT	VENT
VIB	VIBRATION
VTX	VORTEX
WAS	WASTE ACTIVATED SLUDGE
WAT	WATER
WG	WEIR GATE
WNH	WINCH

MATERIAL OF CONSTRUCTION

BS	BLACK STEEL
CISP	CAST IRON SOIL PIPE
CPVC	CHLORINATED POLYVINYL CHLORIDE
CSP	CARBON STEEL (SEAMLESS)
CU	COPPER
DIP	DUCTILE IRON PIPE
FRP	FIBERGLASS REINFORCED PLASTIC
FTB	FLEXIBLE TUBING
GS	GALVANIZED STEEL
PB	POLYBUTYLENE
PE	POLYETHYLENE
PP	POLYPROPYLENE
PU	POLYURETHANE
PVC	POLYVINYL CHLORIDE
RH	RUBBER HOSE
STL	STEEL PIPE (FABRICATED)
SSTL	STAINLESS STEEL

VALVE TYPES

BLV	BALL VALVE
BV	BUTTERFLY VALVE
CNV	CONE VALVE
CV	CHECK VALVE
DV	DIAPHRAGM VALVE
GV	GATE VALVE
GBV	GLOBE VALVE
KV	KNIFE VALVE
MO	MOTOR OPERATED VALVE
MV	MUD VALVE
NV	NEEDLE VALVE
PHV	PINCH VALVE
PV	PLUG VALVE
PRV	PRESSURE REDUCING VALVE

NOTES:
1. ALL DETAIL WIRING AND ELECTRICAL COMPONENTS ARE NOT SHOWN ON THE PROCESS AND INSTRUMENTATION DIAGRAM DRAWINGS. THE ELECTRICAL DRAWINGS ARE TO BE USED IN CONJUNCTION WITH THE PROCESS AND INSTRUMENTATION DIAGRAM DRAWINGS. THE PROCESS AND INSTRUMENTATION DIAGRAM DRAWINGS ARE PRESENTED AS A COORDINATING TOOL THAT INDICATES THE MAIN CONTROL LOGIC FOR THE PROJECT PROCESS SYSTEMS AND COMPONENTS. ACTUAL DETAIL LOGIC AND CONTROL COMPONENTS MAY DIFFER DEPENDING ON THE MANUFACTURER THAT IS AWARDED THE CONTRACT.
2. SEE CIVIL AND PROCESS DRAWINGS FOR PIPING DETAILS.
3. ALL INFORMATION ON THIS LEGEND MAY NOT BE USED.

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Drawn By:	CAC
Reviewed By:	RCF
Approved By:	LES
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
ABBREVIATIONS, NOTES, AND LEGEND

Sheet Number:
I100

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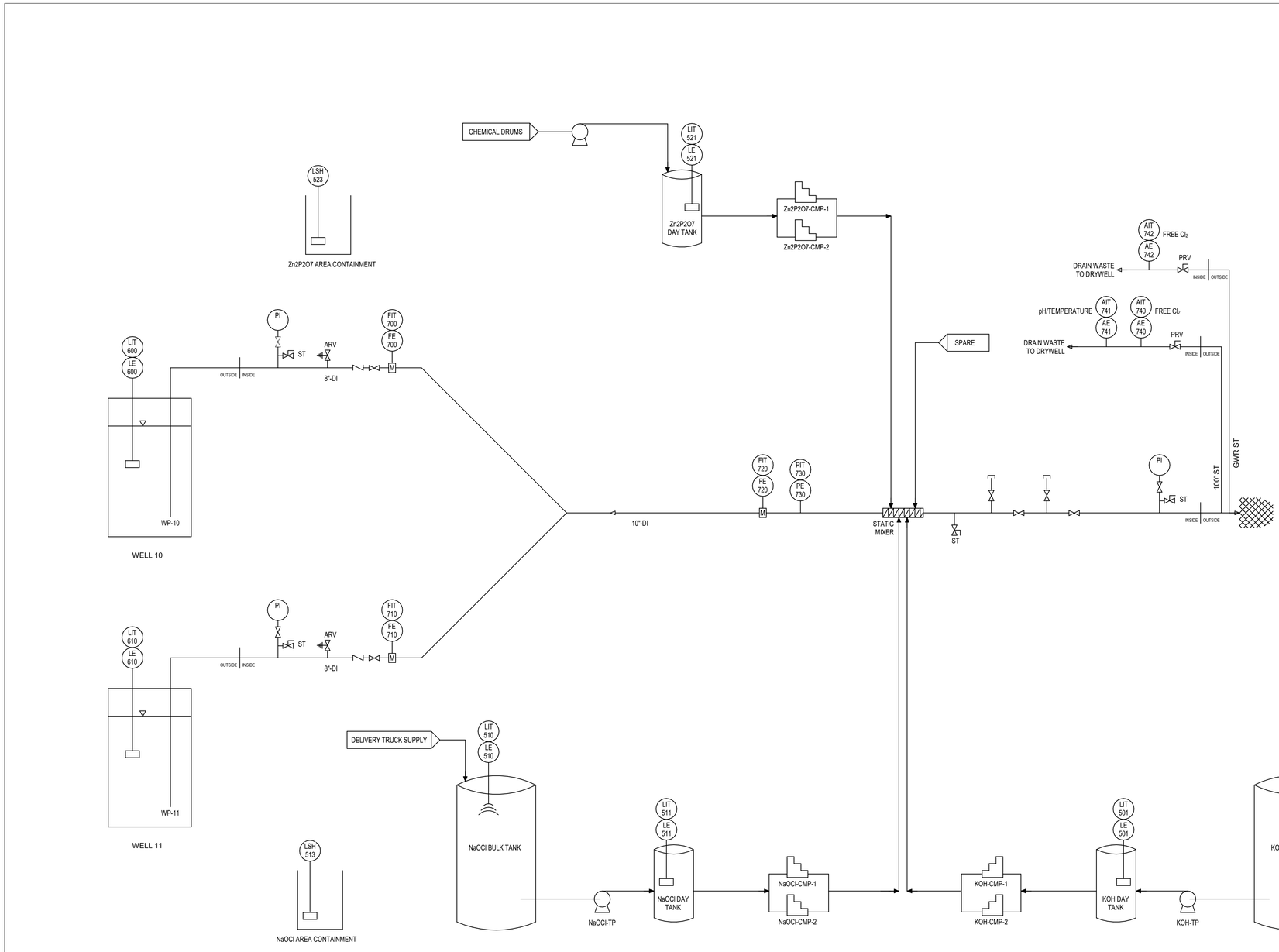

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Scale: NTS

Key Plan:

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PIPING & INSTRUMENTATION DIAGRAM

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I101

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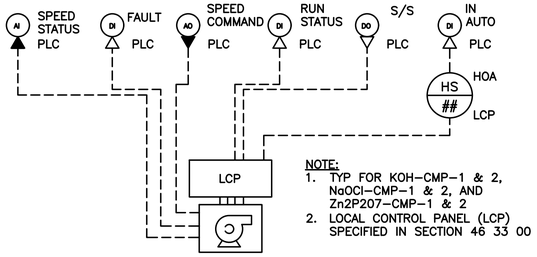

CHEMICAL METERING PUMP CONTROL DETAIL

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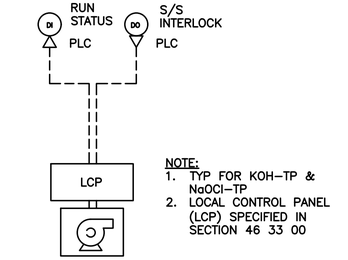

TRANSFER PUMP CONTROL DETAIL

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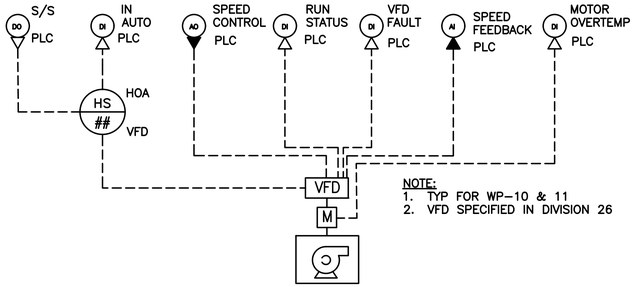

VARIABLE SPEED MOTOR CONTROL DETAIL

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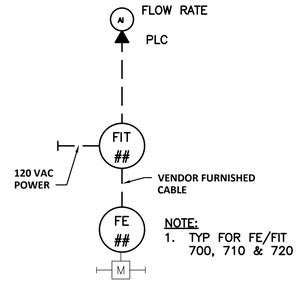

FLOWMETER CONTROL DETAIL

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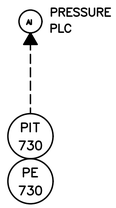

PRESSURE TRANSMITTER CONTROL DETAIL

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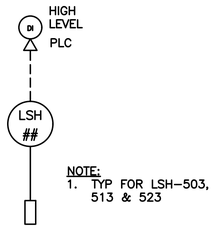

CHEMICAL SPILL SWITCH CONTROL DETAIL

N.T.S.

EYEWASH/SHOWER FLOW SWITCH CONTROL DETAIL

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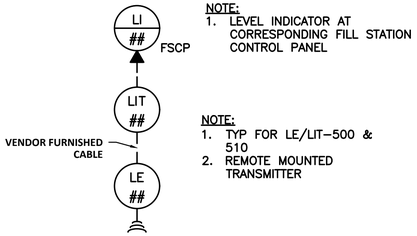

ULTRASONIC LIQUID LEVEL CONTROL DETAIL (BULK TANK)

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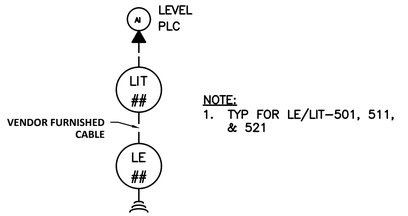

ULTRASONIC LIQUID LEVEL CONTROL DETAIL (DAY TANK)

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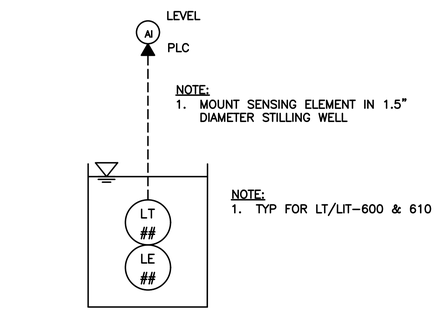

WELL LEVEL TRANSMITTER CONTROL DETAIL

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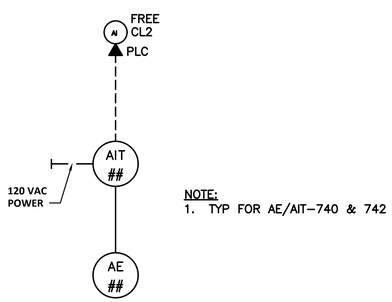

FREE CHLORINE ANALZYER CONTROL DETAIL

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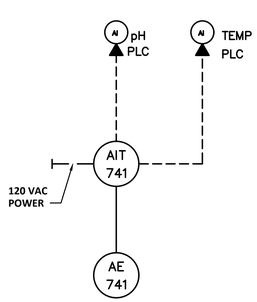

pH/TEMP ANALZYER CONTROL DETAIL

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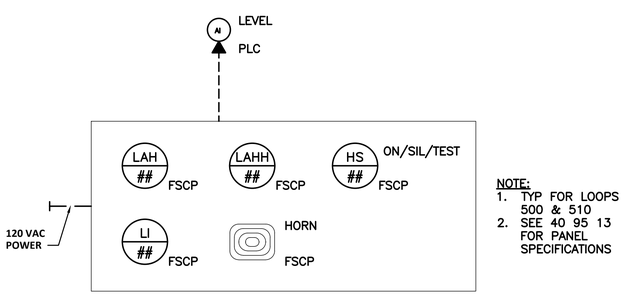

FILL STATION CONTROL PANEL DETAIL

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CONTROL DIAGRAMS I

Sheet Number:
I102

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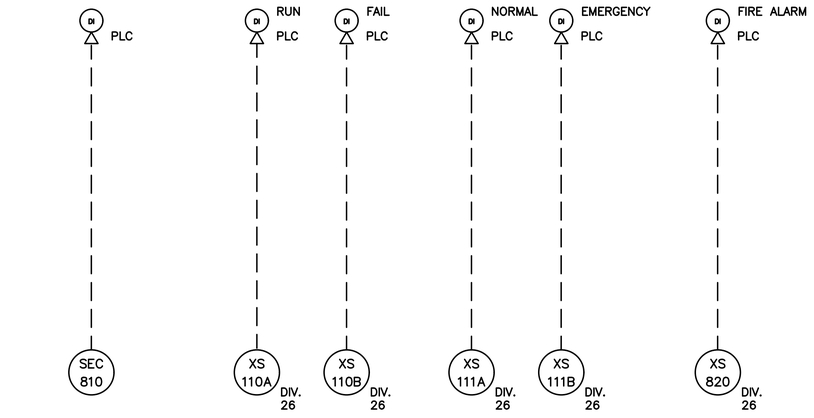

SECURITY ALARM DETAIL
N.T.S.

GENERATOR DETAIL
N.T.S.

ATS DETAIL
N.T.S.

FACP DETAIL
N.T.S.

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DIAGRAMS II

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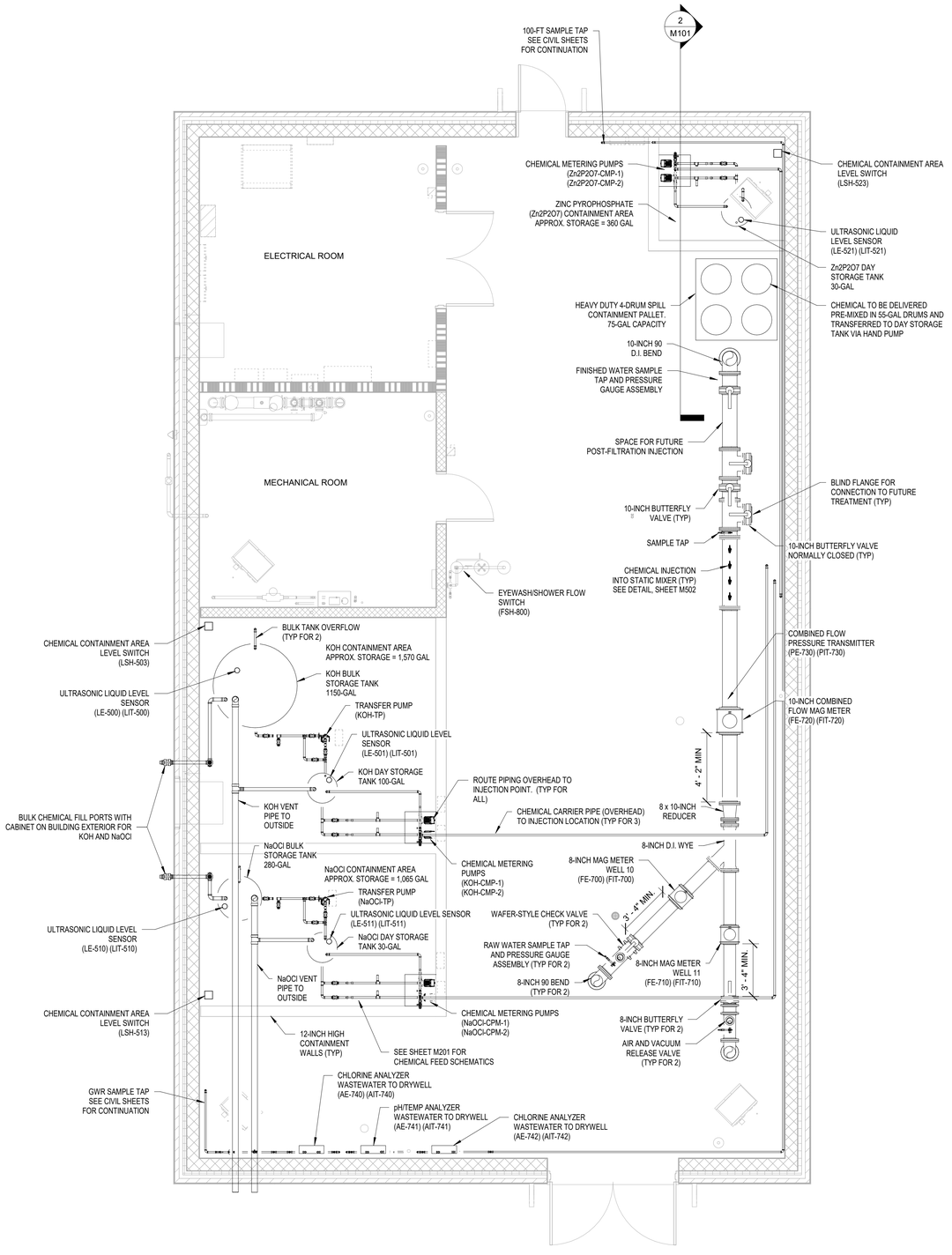
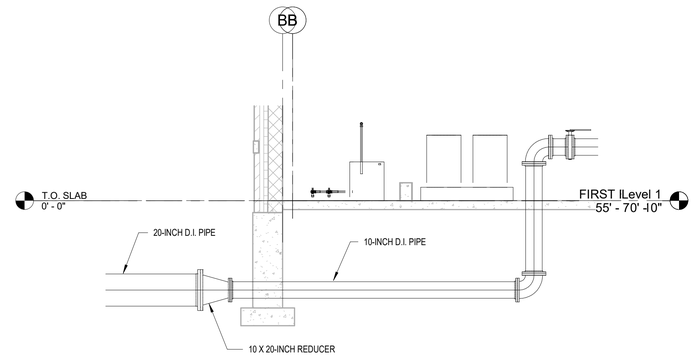


1 PROCESS PIPING FIRST FLOOR
1/4" = 1'-0"



2 Section 1
1/4" = 1'-0"

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COMMONWEALTH OF MASSACHUSETTS
LEAH E. STANTON
No. 45778
REGISTERED PROFESSIONAL ENGINEER

Issued For:
BID

Scale: 1/4" = 1'-0"

Key Plan:

NORTH

Date:	03 / 30 / 2022
Drawn By:	CAC
Reviewed By:	RCF
Approved By:	LES
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
PROCESS PIPING PLAN

Sheet Number:
M101

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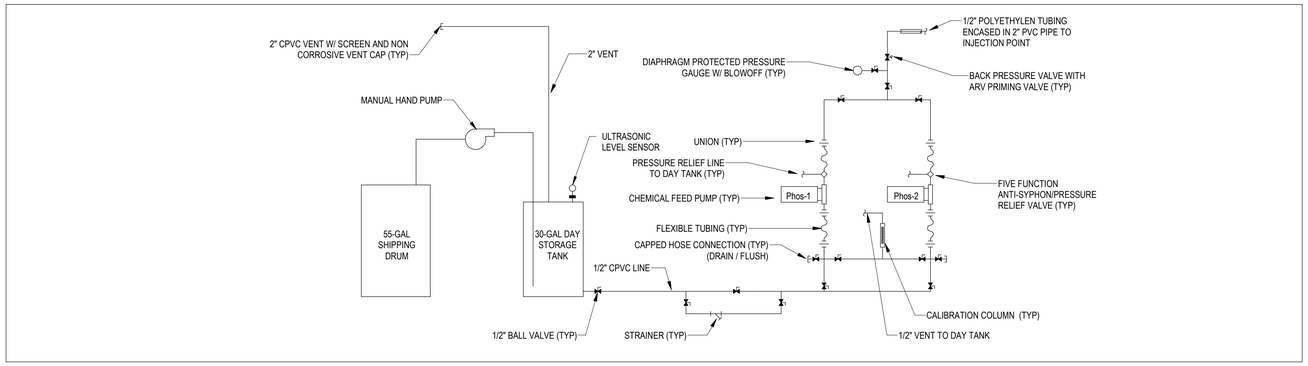
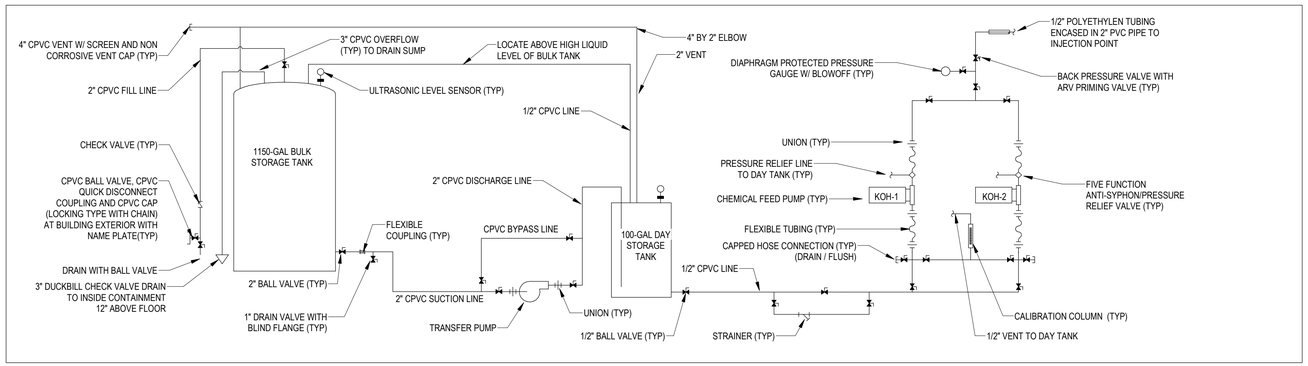
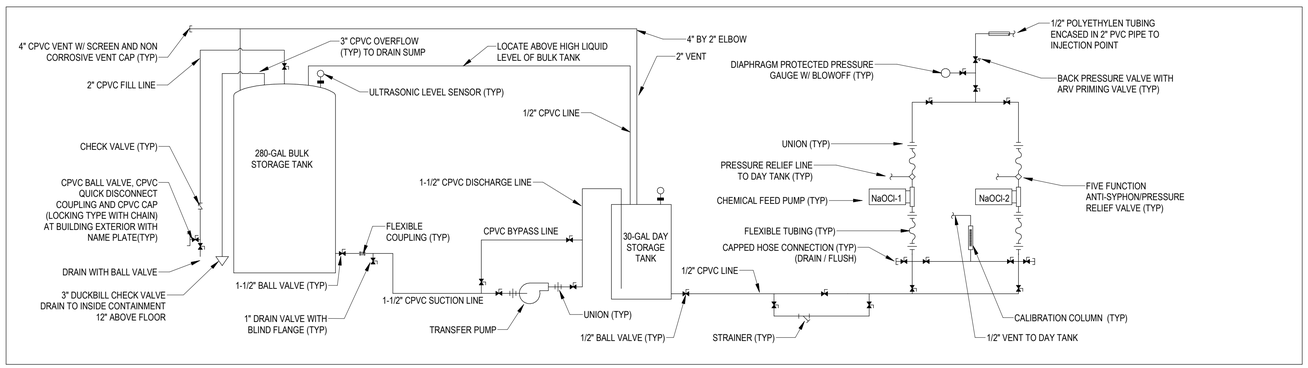

2" CPVC VENT W/ SCREEN AND NON CORROSIVE VENT CAP (TYP)
2" VENT
1/2" POLYETHYLEN TUBING ENCASED IN 2" PVC PIPE TO INJECTION POINT
DIAPHRAGM PROTECTED PRESSURE GAUGE W/ BLOWOFF (TYP)
BACK PRESSURE VALVE WITH ARV PRIMING VALVE (TYP)
MANUAL HAND PUMP
ULTRASONIC LEVEL SENSOR
UNION (TYP)
PRESSURE RELIEF LINE TO DAY TANK (TYP)
FIVE FUNCTION ANTI-SYPHON/PRESSURE RELIEF VALVE (TYP)
CHEMICAL FEED PUMP (TYP)
Phos-1
Phos-2
55-GAL SHIPPING DRUM
30-GAL DAY STORAGE TANK
FLEXIBLE TUBING (TYP)
CAPPED HOSE CONNECTION (TYP) (DRAIN / FLUSH)
1/2" CPVC LINE
CALIBRATION COLUMN (TYP)
1/2" BALL VALVE (TYP)
STRAINER (TYP)
1/2" VENT TO DAY TANK

1 ZINC PYROPHOSPHATE
NOT TO SCALE


4" CPVC VENT W/ SCREEN AND NON CORROSIVE VENT CAP (TYP)
3" CPVC OVERFLOW (TYP) TO DRAIN SUMP
LOCATE ABOVE HIGH LIQUID LEVEL OF BULK TANK
4" BY 2" ELBOW
2" VENT
2" CPVC FILL LINE
ULTRASONIC LEVEL SENSOR (TYP)
1/2" CPVC LINE
1/2" POLYETHYLEN TUBING ENCASED IN 2" PVC PIPE TO INJECTION POINT
DIAPHRAGM PROTECTED PRESSURE GAUGE W/ BLOWOFF (TYP)
BACK PRESSURE VALVE WITH ARV PRIMING VALVE (TYP)
CHECK VALVE (TYP)
1150-GAL BULK STORAGE TANK
UNION (TYP)
PRESSURE RELIEF LINE TO DAY TANK (TYP)
2" CPVC DISCHARGE LINE
CHEMICAL FEED PUMP (TYP)
KOH-1
KOH-2
FIVE FUNCTION ANTI-SYPHON/PRESSURE RELIEF VALVE (TYP)
CPVC BALL VALVE, CPVC QUICK DISCONNECT COUPLING AND CPVC CAP (LOCKING TYPE WITH CHAIN) AT BUILDING EXTERIOR WITH NAME PLATE(TYP)
FLEXIBLE COUPLING (TYP)
CPVC BYPASS LINE
100-GAL DAY STORAGE TANK
FLEXIBLE TUBING (TYP)
CAPPED HOSE CONNECTION (TYP) (DRAIN / FLUSH)
DRAIN WITH BALL VALVE
1/2" CPVC LINE
3" DUCKBILL CHECK VALVE DRAIN TO INSIDE CONTAINMENT 12" ABOVE FLOOR
2" BALL VALVE (TYP)
2" CPVC SUCTION LINE
CALIBRATION COLUMN (TYP)
1" DRAIN VALVE WITH BLIND FLANGE (TYP)
TRANSFER PUMP
UNION (TYP)
1/2" BALL VALVE (TYP)
STRAINER (TYP)
1/2" VENT TO DAY TANK

2 POTASSIUM HYDROXIDE
NOT TO SCALE


4" CPVC VENT W/ SCREEN AND NON CORROSIVE VENT CAP (TYP)
3" CPVC OVERFLOW (TYP) TO DRAIN SUMP
LOCATE ABOVE HIGH LIQUID LEVEL OF BULK TANK
4" BY 2" ELBOW
2" VENT
2" CPVC FILL LINE
ULTRASONIC LEVEL SENSOR (TYP)
1/2" CPVC LINE
1/2" POLYETHYLEN TUBING ENCASED IN 2" PVC PIPE TO INJECTION POINT
DIAPHRAGM PROTECTED PRESSURE GAUGE W/ BLOWOFF (TYP)
BACK PRESSURE VALVE WITH ARV PRIMING VALVE (TYP)
CHECK VALVE (TYP)
280-GAL BULK STORAGE TANK
UNION (TYP)
PRESSURE RELIEF LINE TO DAY TANK (TYP)
1-1/2" CPVC DISCHARGE LINE
CHEMICAL FEED PUMP (TYP)
NaOCl-1
NaOCl-2
FIVE FUNCTION ANTI-SYPHON/PRESSURE RELIEF VALVE (TYP)
CPVC BALL VALVE, CPVC QUICK DISCONNECT COUPLING AND CPVC CAP (LOCKING TYPE WITH CHAIN) AT BUILDING EXTERIOR WITH NAME PLATE(TYP)
FLEXIBLE COUPLING (TYP)
CPVC BYPASS LINE
30-GAL DAY STORAGE TANK
FLEXIBLE TUBING (TYP)
CAPPED HOSE CONNECTION (TYP) (DRAIN / FLUSH)
DRAIN WITH BALL VALVE
1/2" CPVC LINE
3" DUCKBILL CHECK VALVE DRAIN TO INSIDE CONTAINMENT 12" ABOVE FLOOR
1-1/2" BALL VALVE (TYP)
1-1/2" CPVC SUCTION LINE
CALIBRATION COLUMN (TYP)
1" DRAIN VALVE WITH BLIND FLANGE (TYP)
TRANSFER PUMP
UNION (TYP)
1/2" BALL VALVE (TYP)
STRAINER (TYP)
1/2" VENT TO DAY TANK

3 SODIUM HYPOCHLORITE
NOT TO SCALE

NOTES:
1. PROVIDE UNIONS AND / OR FLEXIBLE CONNECTIONS AS REQUIRED AT PUMPS, TANK CONNECTIONS AND VALVES.
2. REFER TO SPECIFICATIONS FOR SIZE AND DIMENSIONS OF TANKS, CHEMICAL FEED EQUIPMENT AND APPURTENANCES.
3. CHEMICAL FEED PUMPS SHALL BE INSTALLED SUCH THAT VALVE ASSEMBLIES AND LIQUID ENDS ARE ACCESSIBLE AND REMOVABLE.
4. PROVIDE PVC OR FRP UNI -STRUT SUPPORTS ON WALL AND USE PIPE HANGERS TO SUPPORT CHEMICAL FEED PIPING FROM CEILING.
5. ALL CHEMICAL FEED LINES SHALL BE 1/2" UNLESS OTHERWISE NOTED.
6. TANK VENTS SHALL RUN VERTICAL FROM DAY, TO JUST BELOW CEILING, AND THEN HORIZONALLY THROUGH BUILDING EXTERIOR WALL. THE TANK VENT PENETRATION DETAIL IS SHOWN ON THIS SHEET.
7. STRAINERS SHALL BE INSTALLED A MINIMUM 4" ABLOVE THE FINISHED FLOOR.

Project:
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221 CROWELL ROAD CHATHAM, MA 02633

WELL 10 AND 11 PUMPING AND TREATMENT DESIGN
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No.	Date	Description

COA:

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COMMONWEALTH OF MASSACHUSETTS
LEAH E. STANTON
No. #57719
REGISTERED PROFESSIONAL ENGINEER

Issued For:
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Scale: NTS

Key Plan:

NORTH

Date:	03 / 30 / 2022
Drawn By:	CAC
Reviewed By:	RCF
Approved By:	LES
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
CHEMICAL FEED SCHEMATICS

Sheet Number:
M201

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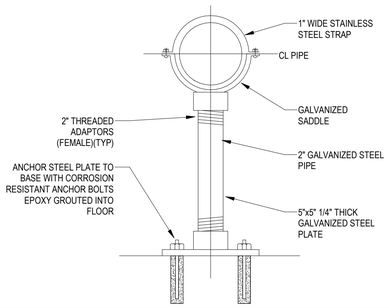
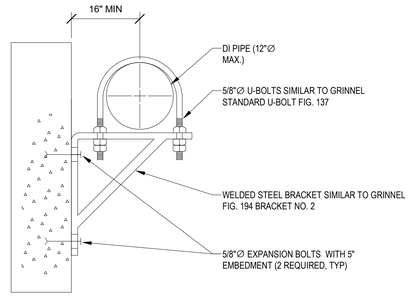
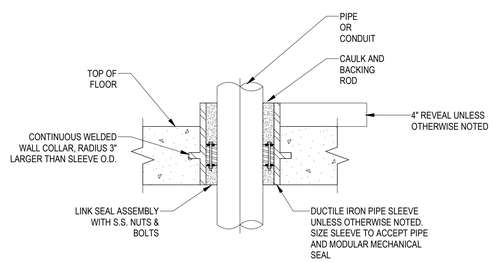

1" WIDE STAINLESS STEEL STRAP
CL PIPE
GALVANIZED SADDLE
2" THREADED ADAPTORS (FEMALE)(TYP)
2" GALVANIZED STEL PIPE
ANCHOR STEEL PLATE TO BASE WITH CORROSION RESISTANT ANCHOR BOLTS EPOXY GROUTED INTO FLOOR
5"x5" 1/4" THICK GALVANIZED STEEL PLATE

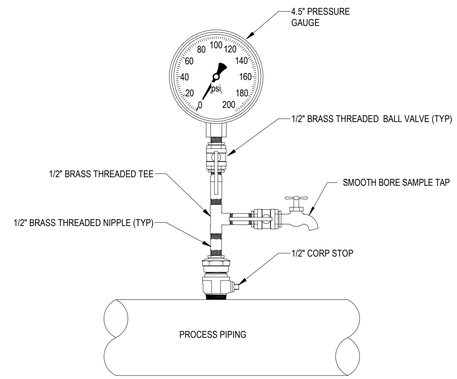
1 ADJUSTABLE STEEL PIPE SUPPORT
NOT TO SCALE


16" MIN
DI PIPE (12"Ø MAX.)
5/8"Ø U-BOLTS SIMILAR TO GRINNEL STANDARD U-BOLT FIG. 137
WELDED STEEL BRACKET SIMILAR TO GRINNEL FIG. 194 BRACKET NO. 2
5/8"Ø EXPANSION BOLTS WITH 5" EMBEDMENT (2 REQUIRED, TYP)

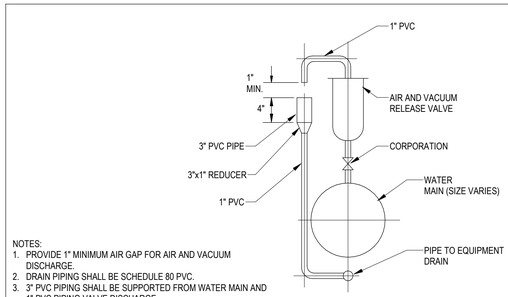
2 PIPE SUPPORT DETAIL
NOT TO SCALE


PIPE OR CONDUIT
CAULK AND BACKING ROD
TOP OF FLOOR
4" REVEAL UNLESS OTHERWISE NOTED
CONTINUOUS WELDED WALL COLLAR, RADIUS 3" LARGER THAN SLEEVE O.D.
LINK SEAL ASSEMBLY WITH S.S. NUTS & BOLTS
DUCTILE IRON PIPE SLEEVE UNLESS OTHERWISE NOTED. SIZE SLEEVE TO ACCEPT PIPE AND MODULAR MECHANICAL SEAL

3 FLOOR SLEEVE DETAIL
NOT TO SCALE

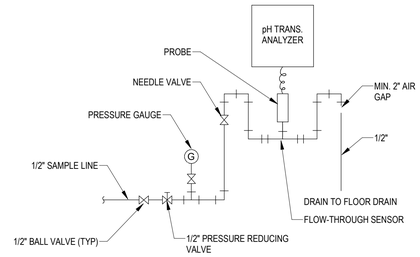


COMBINED GAUGE ASSEMBLY AND SAMPLE TAP DETAIL
NOT TO SCALE

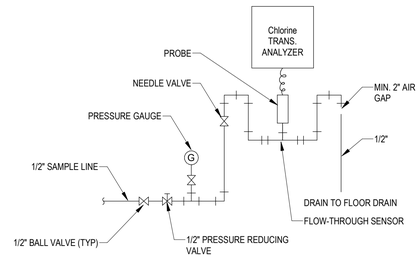


NOTES:
1. PROVIDE 1" MINIMUM AIR GAP FOR AIR AND VACUUM DISCHARGE.
2. DRAIN PIPING SHALL BE SCHEDULE 80 PVC.
3. 3" PVC PIPING SHALL BE SUPPORTED FROM WATER MAIN AND 1" PVC PIPING VALVE DISCHARGE.

5 AIR AND VACUUM RELEASE AND AIR RELEASE VALVE
NOT TO SCALE



6 pH ANALYZER
NOT TO SCALE



7 CHLORINE ANALYZER
NOT TO SCALE

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COA:

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Issued For:
BID

Scale: NTS

Key Plan:

NORTH

Date:	03 / 30 / 2022
Drawn By:	CAC
Reviewed By:	RCF
Approved By:	LES
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
PROCESS DETAILS

Sheet Number:
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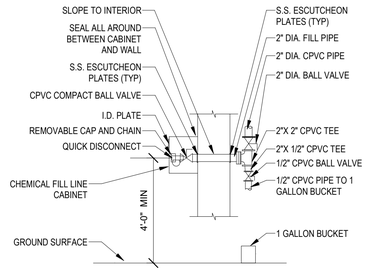
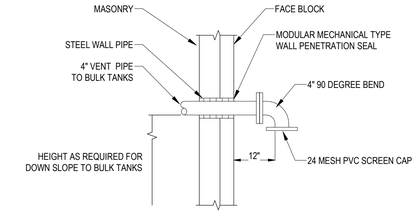


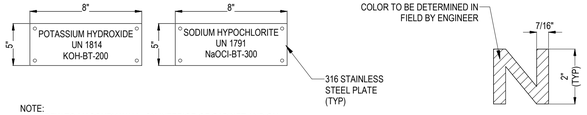
NOTES:
1. ALL STAINLESS STEEL MATERIALS ARE 316 SERIES.
2. MOUNTED FLUSH TO BUILDING WALL ELASTOMETRIC SEAL CONTACT JOINTS.
3. FILL STATION ROOF SHALL BE SLOPED AWAY FROM BUILDING.

1 CHEMICAL FILL LINE
NOT TO SCALE


MASONRY
FACE BLOCK
STEEL WALL PIPE
MODULAR MECHANICAL TYPE WALL PENETRATION SEAL
4" VENT PIPE TO BULK TANKS
4" 90 DEGREE BEND
HEIGHT AS REQUIRED FOR DOWN SLOPE TO BULK TANKS
12"
24 MESH PVC SCREEN CAP

NOTE:
1. VENTS SHALL NOT BE INSTALLED DIRECTLY OVER ANY CONTROL PANELS OR ELECTRICAL DEVICES.

3 TYPICAL CHEMICAL BULK TANK VENT DETAIL
NOT TO SCALE

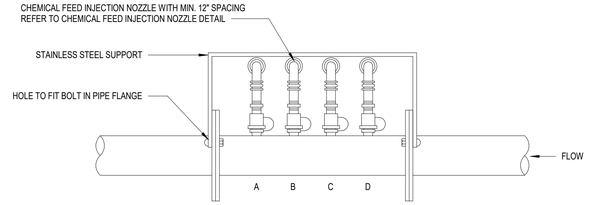


NOTE:
1. SCREW TO MASONRY WALL, ON INTERIOR OF CABINET AND ON THE FRONT OF THE FILL CABINET DOOR USING 316SS SCREWS.

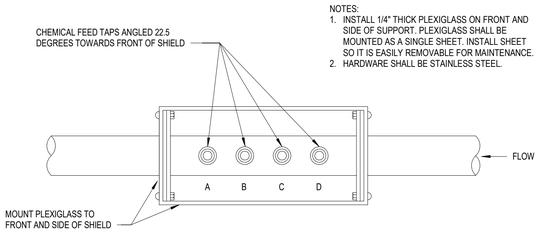
FILL PIPE I.D. LABELS

CHEMICAL TANK I.D. VINYL LETTERING DETAIL

4 FILL PIPE AND CHEMICAL TANK I.D. LABELS
NOT TO SCALE



ELEVATION



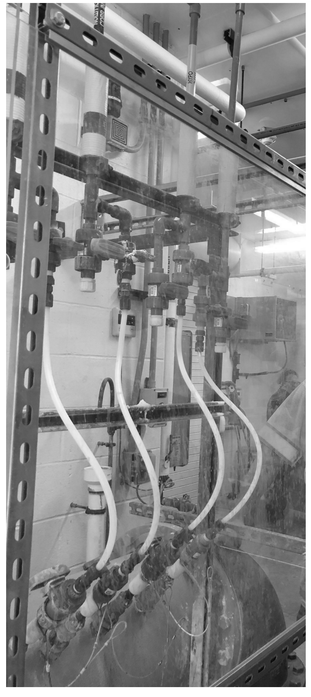
NOTES:
1. INSTALL 1/4" THICK PLEXIGLASS ON FRONT AND SIDE OF SUPPORT. PLEXIGLASS SHALL BE MOUNTED AS A SINGLE SHEET. INSTALL SHEET SO IT IS EASILY REMOVABLE FOR MAINTENANCE.
2. HARDWARE SHALL BE STAINLESS STEEL.

PLAN

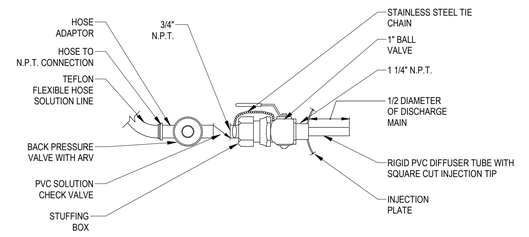
ID	DESCRIPTION	NOZZLE	TUBE
A	SPARE	1 IN	1/2 IN
B	POTASSIUM HYDROXIDE	1 IN	1/2 IN
C	SODIUM HYPOCHLORITE	1 IN	1/2 IN
D	ZINC PYROPHOSPHATE	1 IN	1/2 IN

6 COMBINED GAUGE ASSEMBLY AND SAMPLE TAP DETAIL
NOT TO SCALE

2 CHEMICAL FILL PORT IMAGE
NOT TO SCALE



5 CHEMICAL INJECTION IMAGE
NOT TO SCALE



NOTE:
1. LABEL CHEMICAL INJECTION PIPE WITHIN 3 FEET OF INJECTION POINT WITH COLOR PLASTIC TAG.

7 CHEMICAL FEED INJECTION NOZZLE DETAIL
NOT TO SCALE

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Key Plan:

Date:	03 / 30 / 2022
Drawn By:	CAC
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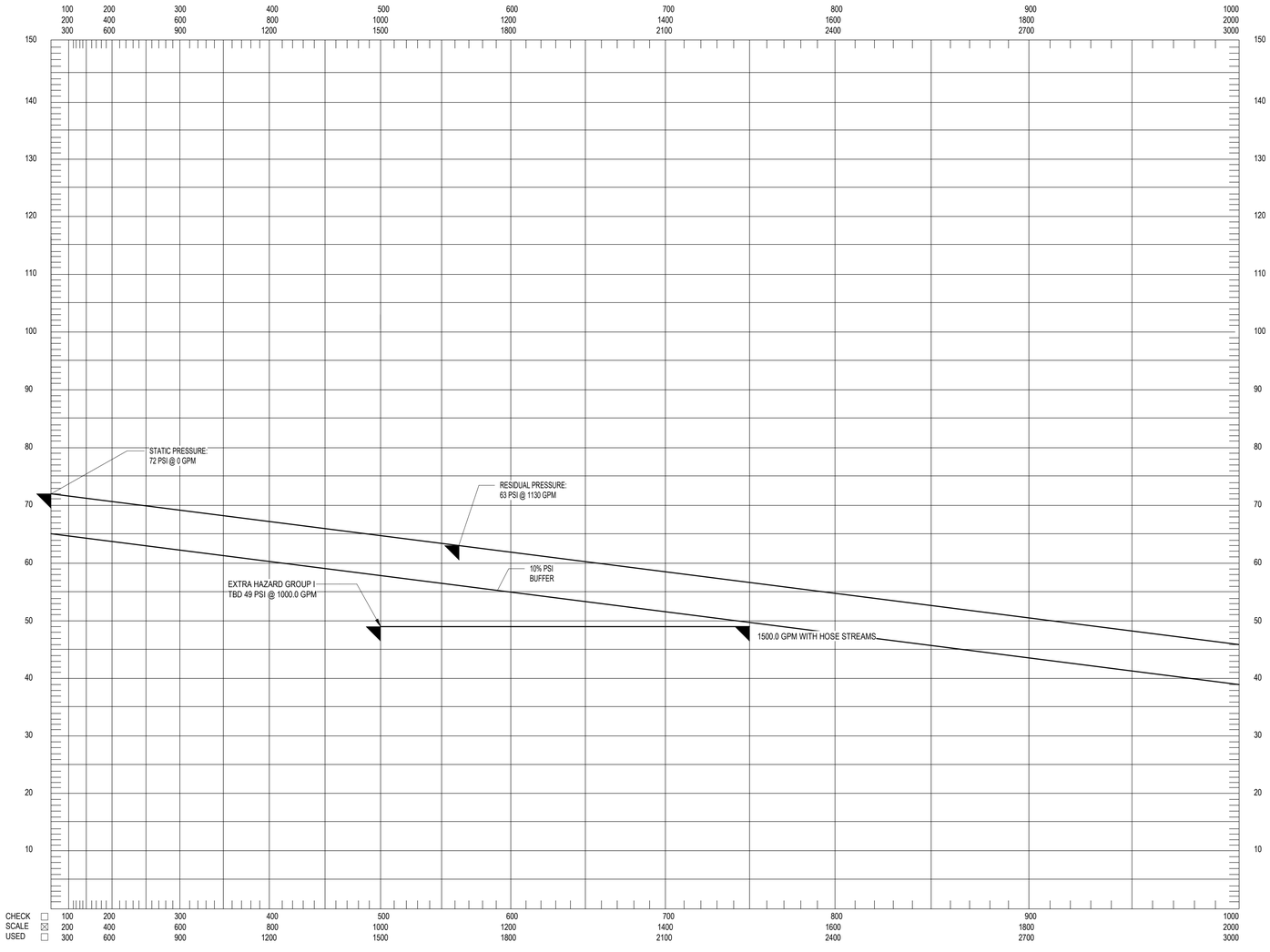
WATER SUPPLY GRAPH NO. N^1.85



HYDRAULIC GRAPH

NOT TO SCALE

FIRE PROTECTION LEGEND:

⊢C⊣	SPRINKLER SYSTEM PIPING (PROPOSED)
WS	SPRINKLER WET SYSTEM PIPING
DN	TO DOWN
○	UPRIGHT SPRINKLER HEAD
◁	HORIZONTAL SIDEWALL SPRINKLER HEAD

FIRE PROTECTION NOTES:

1. THE FIRE PROTECTION CONTRACTOR IS RESPONSIBLE FOR SPRINKLER PIPING LAYOUT AND HYDRAULIC CALCULATIONS TO MEET THE REQUIREMENTS OF 2013 EDITION OF NFPA #13. NOTE THAT THE LAYOUTS SHOW ARE CONCEPTUAL; DO NOT COUNT SPRINKLERS OR MEASURE PIPE RUNS.
2. THE FIRE PROTECTION CONTRACTOR SHALL PREPARE INSTALLATION DRAWINGS AND SUBMIT THEM TO THE ENGINEER AND LOCAL OFFICIAL FOR APPROVAL. SHOP DRAWING APPROVAL FROM THE AUTHORITY HAVING JURISDICTION IS REQUIRED PRIOR TO THE START OF SYSTEM INSTALLATION. NOTE THAT THE CONTRACTOR PRICE SHALL INCLUDE ALL NECESSARY SPRINKLERS AND PIPING NEEDED FOR APPROVAL, REGARDLESS OF LAYOUTS PROVIDED, AT NO ADDITIONAL COST TO THE OWNER.
3. THE LOCATION OF THE WATER SERVICE ENTRANCE, FIRE PROTECTION RISERS AND BACKFLOW PREVENTER TEST HEADER SHALL BE AS SHOWN.
4. FIRE PROTECTION CONTRACTOR SHALL PROVIDE NECESSARY SUPPLEMENTAL FRAMING BETWEEN PRIMARY FRAMING TO SUPPORT FIRE PROTECTION SYSTEM WHERE WEIGHT OF PIPING, WATER AND EQUIPMENT EXCEED COLLATERAL LOAD LIMITS OF PURLOINS. REFER TO STRUCTURAL DRAWINGS.
5. FINAL FIRE DEPARTMENT CONNECTION LOCATION SHALL BE COORDINATED WITH THE AUTHORITY HAVING JURISDICATION.

FIRE PROTECTION DESIGN CRITERIA:

1. PROVIDE A HYDRANT FLOW TEST CLOSE TO THE BUILDING BEFORE PROVIDING A COMPLETE HYDRAULIC CALCULATION AND DISTRIBUTION SYSTEM DESIGN UTILIZING THE DESIGN CRITERIA ESTABLISHED ON SHEET FP000. HYDRAULIC CALCULATIONS FOR THE SYSTEM SHALL INCLUDE A 10% PSI OF THE AVAILABLE PRESSURE AS A CUSHION.
2. A PRELIMINARY SYSTEM DESIGN WAS BE BASED ON A FLOW TEST CONDUCTED ON NOVEMBER 04, 2019 BY WESTON AND SAMPSON. FLOW AND GAUGE HYDRANTS LOCATED ON WADING PLACE PATH STREET.

   STATIC PRESSURE = 72 PSI
   RESIDUAL PRESSURE = 63 PSI
   FLOW= 1130 GPM

2. REQUIRED DESIGN FLOWS:

   A. DESIGN HAZARDS:

   SEE OCCUPANCY HAZARD CLASSIFICATION SCHEDULE ON SHEET FP000

OCCUPANCY HAZARD CLASSIFICATION...

LOCATION NO.	LOCATION Name	Occupancy Hazard Classification Symbol
101		EH1
102	MECH. ROOM	OH1
103	ELEC. ROOM	OH1

B. REQUIRED DESIGN DENSITIES:

AUTOMATIC SPRINKLER SYSTEM DESIGN CRITERIA

SYMBOL	OCCUPANCY HAZARD CLASSIFICATION	DESIGN DENSITY (GPM/SF)	DESIGN AREA
OH1	ORDINARY HAZARD, GROUP 1 OCCUPANCY	0.15	1500 SF
OH2	ORDINARY HAZARD, GROUP 2 OCCUPANCY	0.20	1500 SF
EH1	EXTRA HAZARD, GROUP 1	0.30	2500 SF

C. COVERAGE AREA & SPRINKLER SPACING (MAX):

COVERAGE AREA / SPRINKLER SPACING	
HAZARD	COVERAGE / MAX SPACING
ORDINARY HAZARD AREAS	130 S.F. / 15'-0"
EXTRA HAZARD	100 S.F. / 15'-0"

Project:
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WELL 10 AND 11 PUMPING AND TRATMENT DESIGN MILL HILL ROAD
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Approved By:	MER
W&S Project No.:	ENG21 - 1001
W&S File No.:	TBD

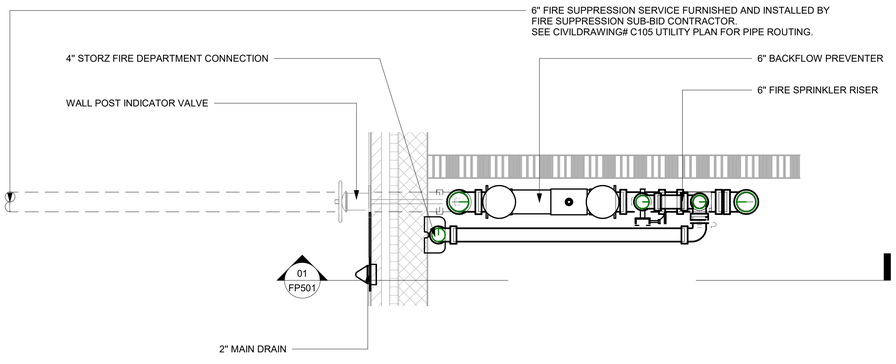
Drawing Title:

FIRE PROTECTION LEGENDS, NOTES AND ABBREVIATIONS

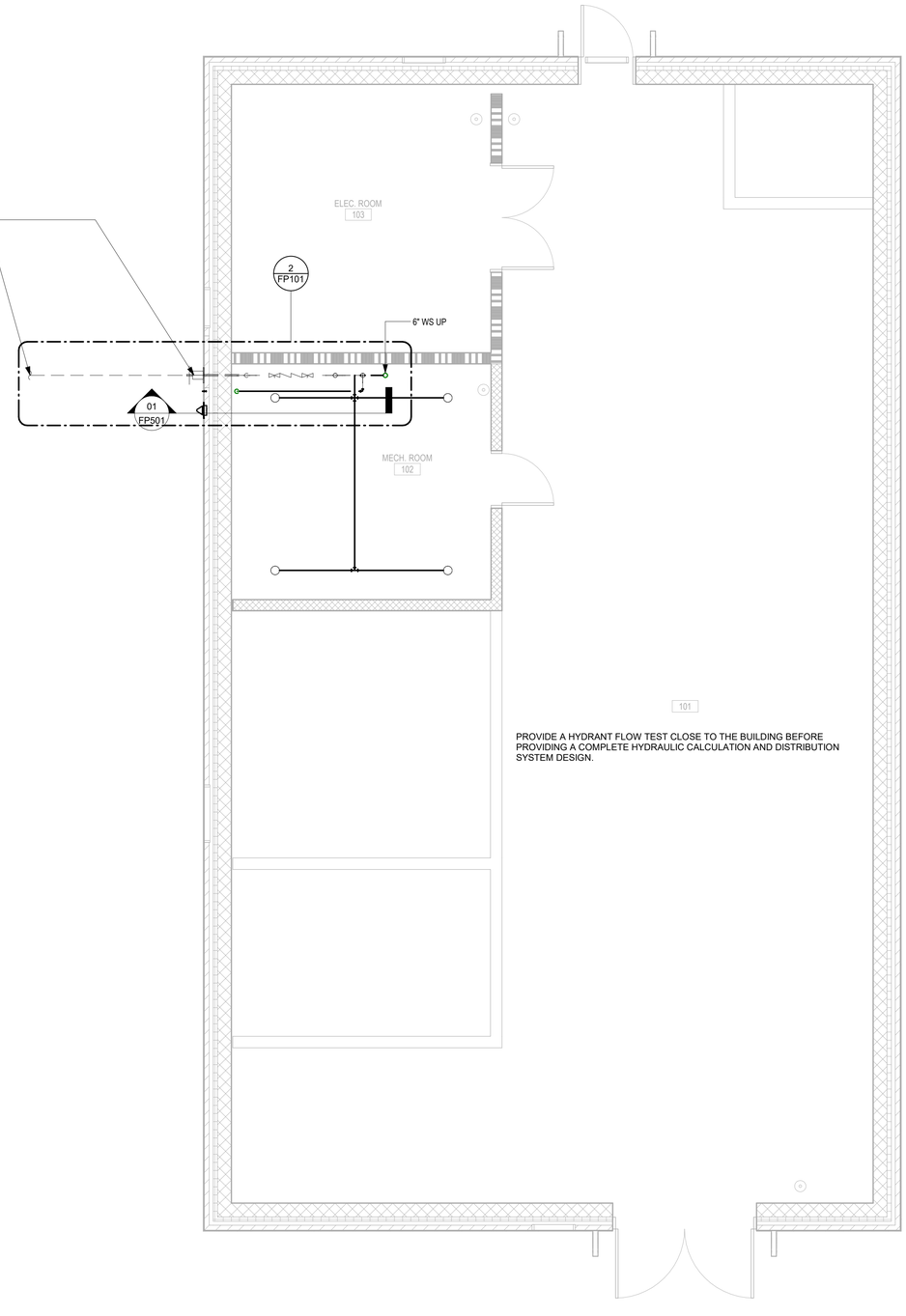
Sheet Number:

FP000

3/28/2022 12:03:40 PM \\wse03.local\WSE\Projects\MA\Chatham MA\Well 10 and 11 -Pumping and Treatment Design\CAD\Fire Protection\Chatham Well 10&11_Fire Protection_V20.rvt


6" FIRE SUPPRESSION SERVICE FURNISHED AND INSTALLED BY FIRE SUPPRESSION SUB-BID CONTRACTOR. SEE CIVILDRAWING# C105 UTILITY PLAN FOR PIPE ROUTING.
4" STORZ FIRE DEPARTMENT CONNECTION
WALL POST INDICATOR VALVE
6" BACKFLOW PREVENTER
6" FIRE SPRINKLER RISER
01
FP501
2" MAIN DRAIN

2 FP101 FIRE PROTECTION EQUIPMENT ENLARGED DETAL
1/2" = 1'-0"
0 4' 8' 16'


WALL POST INDICATOR VALVE
6" FIRE SUPPRESSION SERVICE FURNISHED AND INSTALLED BY FIRE SUPPRESSION SUB-BID CONTRACTOR. SEE CIVIL DRAWING#C105 UTILITY PLAN FOR PIPE ROUTING.
ELEC. ROOM
103
2
FP101
6" WS UP
01
FP501
MECH. ROOM
102
101
PROVIDE A HYDRANT FLOW TEST CLOSE TO THE BUILDING BEFORE PROVIDING A COMPLETE HYDRAULIC CALCULATION AND DISTRIBUTION SYSTEM DESIGN.

1 FP101 FIRST FLOOR PLAN (LOW CEILING LEVEL)
1/4" = 1'-0"
0 4' 8' 16'

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Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD CHATHAM, MA 02633

WELL 10 AND 11 PUMPING AND TRATMENT DESIGN MILL HILL ROAD CHATHAM, MA 02633

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Seal:

BID SUBMISSION

Scale: As indicated

Key Plan:

NORTH

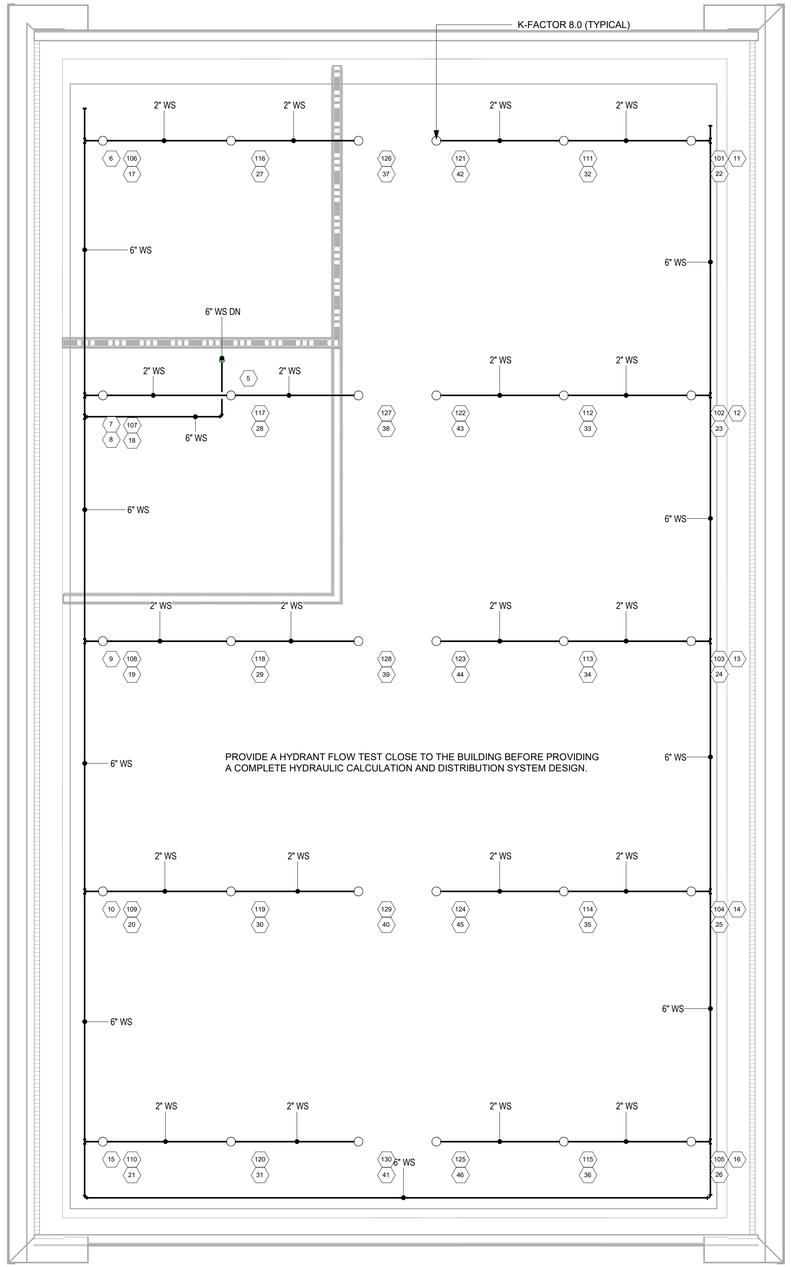
Date:	03 / 28 / 2022
Drawn By:	AI
Reviewed By:	MER
Approved By:	MER
W&S Project No.:	ENG21 - 1001
W&S File No.:	TBD

Drawing Title:

FIRST FLOOR FIRE PROTECTION PLAN (LOW LEVEL)

Sheet Number:

FP101


K-FACTOR 8.0 (TYPICAL)
2" WS
6" WS
6" WS DN
PROVIDE A HYDRANT FLOW TEST CLOSE TO THE BUILDING BEFORE PROVIDING
A COMPLETE HYDRAULIC CALCULATION AND DISTRIBUTION SYSTEM DESIGN.

1 FP102 FIRST FLOOR PLAN (HIGH CEILING LEVEL)
1/4" = 1'-0"
0 4' 8' 16'

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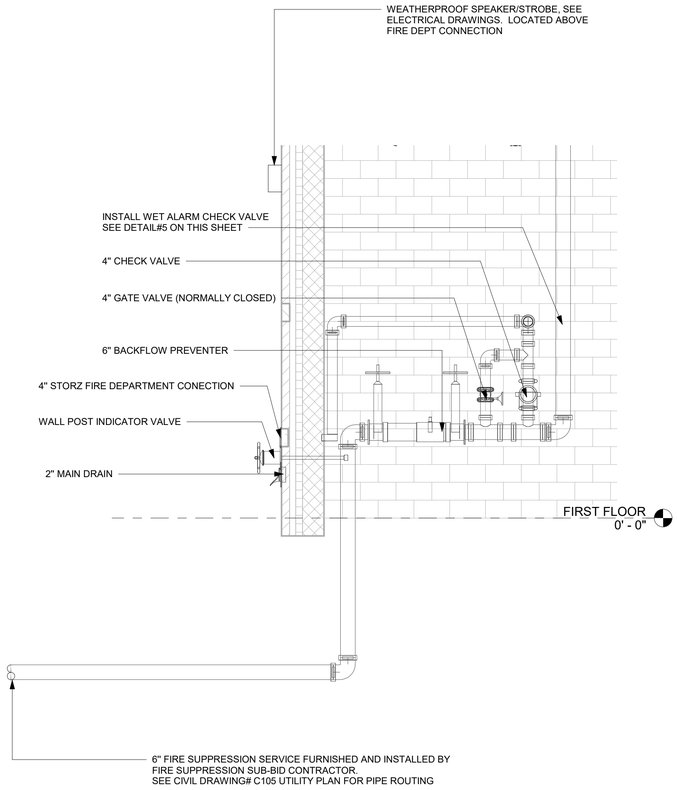
Key Plan:

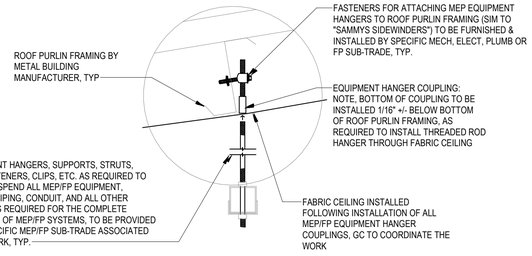
Date:	03 / 28 / 2022
Drawn By:	AI
Reviewed By:	MER
Approved By:	MER
W&S Project No.:	ENG21 - 1001
W&S File No.:	TBD

Drawing Title:
FIRST FLOOR PLAN
FIRE PROTECTION
PLAN (HIGH LEVEL)

Sheet Number:
FP102


WEATHERPROOF SPEAKER/STROBE, SEE ELECTRICAL DRAWINGS. LOCATED ABOVE FIRE DEPT CONNECTION
INSTALL WET ALARM CHECK VALVE SEE DETAIL#5 ON THIS SHEET
4" CHECK VALVE
4" GATE VALVE (NORMALLY CLOSED)
6" BACKFLOW PREVENTER
4" STORZ FIRE DEPARTMENT CONECTION
WALL POST INDICATOR VALVE
2" MAIN DRAIN
FIRST FLOOR
0' - 0"
6" FIRE SUPPRESSION SERVICE FURNISHED AND INSTALLED BY FIRE SUPPRESSION SUB-BID CONTRACTOR. SEE CIVIL DRAWING# C105 UTILITY PLAN FOR PIPE ROUTING

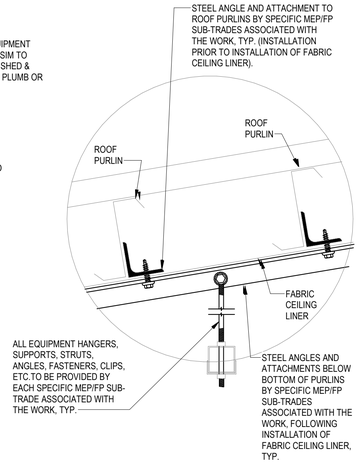
01 FIRE PROTECTION EQUIPMENT SECTION DETAIL
3/8" = 1'-0"

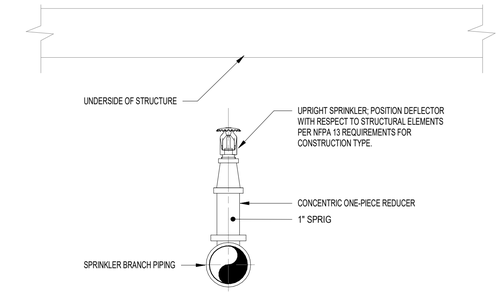

ROOF PURLIN FRAMING BY METAL BUILDING MANUFACTURER, TYP
FASTENERS FOR ATTACHING MEP EQUIPMENT HANGERS TO ROOF PURLIN FRAMING (SIM TO "SAMMYS SIDEWINDERS") TO BE FURNISHED & INSTALLED BY SPECIFIC MECH, ELECT, PLUMB OR FP SUB-TRADE, TYP.
EQUIPMENT HANGER COUPLING; NOTE, BOTTOM OF COUPLING TO BE INSTALLED 1/16" +/- BELOW BOTTOM OF ROOF PURLIN FRAMING, AS REQUIRED TO INSTALL THREADED ROD HANGER THROUGH FABRIC CEILING
ALL EQUIPMENT HANGERS, SUPPORTS, STRUTS, ANGLES, FASTENERS, CLIPS, ETC. AS REQUIRED TO SUPPORT/ SUSPEND ALL MEP/FP EQUIPMENT, DUCTWORK, PIPING, CONDUIT, AND ALL OTHER MATERIALS AS REQUIRED FOR THE COMPLETE INSTALLATION OF MEP/FP SYSTEMS, TO BE PROVIDED BY EACH SPECIFIC MEP/FP SUB-TRADE ASSOCIATED WITH THE WORK, TYP.
FABRIC CEILING INSTALLED FOLLOWING INSTALLATION OF ALL MEP/FP EQUIPMENT HANGER COUPLINGS, GC TO COORDINATE THE WORK

GENERAL NOTES:

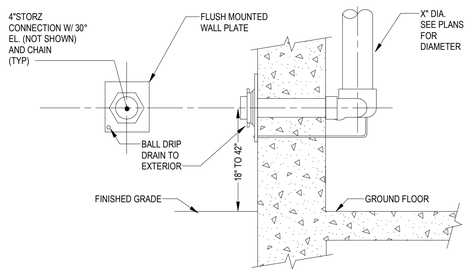
1. ALL MECHANICAL, ELECTRICAL, PLUMBING & FIRE-PTROTECTION (MEP/FP), ETC. SUB-TRADES SHALL PROVIDE AND INSTALL ALL SUPPLEMENTAL STEEL SUPPORTS, ANGLES, STRUTS, CLIPS, ATTACHMENTS, ETC. AS NECESSARY FOR THE COMPLETE INSTALLATION AND SUPPORT OF ALL BUILDING MEP/FP SYSTEMS.
2. ALL MEP/FP SUB-TRADES SHALL SIZE ALL SUPPORTS, ANGLES, CONNECTORS, ETC, AS REQUIRED TO SUPPORT THE LOADS OF THE SUSPENDED SYSTEMS AND SHALL COORDINATE SIZES AND LOCATIONS, AND SHALL OBTAIN APPROVAL FROM THE METAL BUILDING MANUFACTURER.
3. ALL FASTENERS, COUPLINGS, ANGLES, ETC. ATTACHED TO THE BUILDING ROOF PURLIN FRAMING ABOVE THE BOTTOM OF THE PURLIN, TO BE INSTALLED PRIOR TO INSTALLATION OF THE CEILING FABRIC LINER. SUSPENDED SUPPORTS INSTALLED BELOW THE BOTTOM OF THE PURLIN FRAMING TO BE INSTALLED FOLLOWING INSTALLATION OF THE CEILING LINER. GENERAL CONTRACTOR SHALL COORDINATE THE SEQUENCE AND INSTALLATION OF THE WORK.
4. ALL EQUIPMENT LOADS/ REACTIONS IMPOSED ON THE METAL BUILDING FRAMING TO BE REVIEWED AND APPROVED BY THE METAL BUILDING MANUFACTURER. ALL SUPPLEMENTAL BUILDING FRAMING MEMBERS, AS REQUIRED TO SUPPORT MECHANICAL/ ELECTRICAL/ FIRE PROTECTION EQUIPMENT, AS DETERMINED BY THE PREFABRICATED METAL BUILDING DESIGN, IN CONSIDERATION OF ALL EQUIPMENT-IMPOSED LOADS TO THE BUILDING, TO BE PROVIDED BY METAL BUILDING MANUFACTURER.

02 ROOF PURLIN
12" = 1'-0"

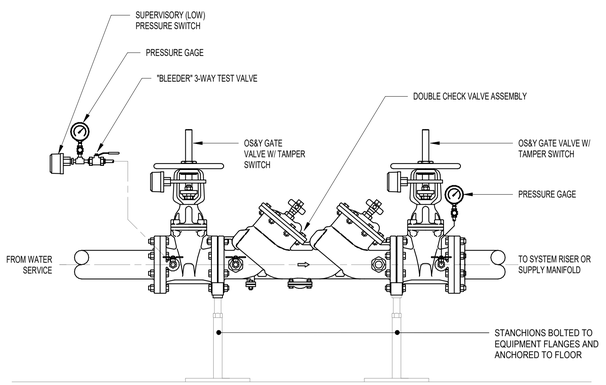

STEEL ANGLE AND ATTACHMENT TO ROOF PURLINS BY SPECIFIC MEP/FP SUB-TRADES ASSOCIATED WITH THE WORK, TYP. (INSTALLATION PRIOR TO INSTALLATION OF FABRIC CEILING LINER).
ROOF PURLIN
ROOF PURLIN
FABRIC CEILING LINER
ALL EQUIPMENT HANGERS, SUPPORTS, STRUTS, ANGLES, FASTENERS, CLIPS, ETC.TO BE PROVIDED BY EACH SPECIFIC MEP/FP SUB-TRADE ASSOCIATED WITH THE WORK, TYP.
STEEL ANGLES AND ATTACHMENTS BELOW BOTTOM OF PURLINS BY SPECIFIC MEP/FP SUB-TRADES ASSOCIATED WITH THE WORK, FOLLOWING INSTALLATION OF FABRIC CEILING LINER, TYP.


UNDERSIDE OF STRUCTURE
UPRIGHT SPRINKLER: POSITION DEFLECTOR WITH RESPECT TO STRUCTURAL ELEMENTS PER NFPA 13 REQUIREMENTS FOR CONSTRUCTION TYPE.
CONCENTRIC ONE-PIECE REDUCER
1" SPRIG
SPRINKLER BRANCH PIPING

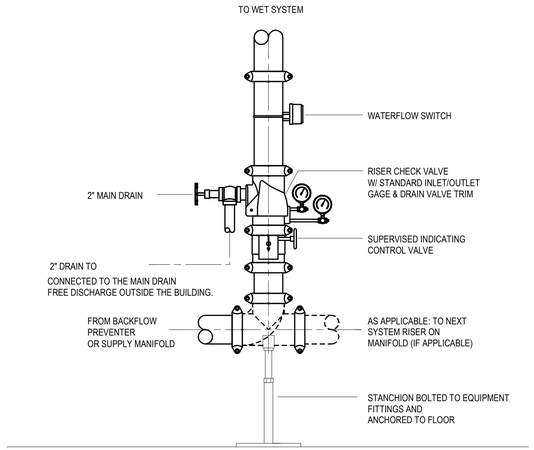
03 UPRIGHT SPRINKLER HEAD
12" = 1'-0"


4"STORZ CONNECTION W/ 30° EL. (NOT SHOWN) AND CHAIN (TYP)
FLUSH MOUNTED WALL PLATE
X" DIA. SEE PLANS FOR DIAMETER
BALL DRIP DRAIN TO EXTERIOR
18" TO 42"
FINISHED GRADE
GROUND FLOOR

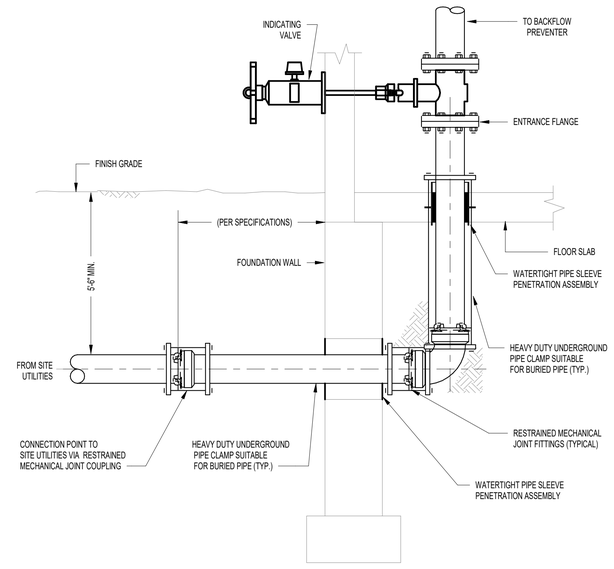
04 FIRE DEPARTMENT CONNECTION DETAIL
12" = 1'-0"


SUPERVISORY (LOW) PRESSURE SWITCH
PRESSURE GAGE
"BLEEDER" 3-WAY TEST VALVE
DOUBLE CHECK VALVE ASSEMBLY
OS&Y GATE VALVE W/ TAMPER SWITCH
OS&Y GATE VALVE W/ TAMPER SWITCH
PRESSURE GAGE
FROM WATER SERVICE
TO SYSTEM RISER OR SUPPLY MANIFOLD
STANCHIONS BOLTED TO EQUIPMENT FLANGES AND ANCHORED TO FLOOR

05 DOUBLE CHECK VALVE ASSEMBLY DETAIL
12" = 1'-0"


TO WET SYSTEM
WATERFLOW SWITCH
2" MAIN DRAIN
RISER CHECK VALVE W/ STANDARD INLET/OUTLET GAGE & DRAIN VALVE TRIM
SUPERVISED INDICATING CONTROL VALVE
2" DRAIN TO CONNECTED TO THE MAIN DRAIN FREE DISCHARGE OUTSIDE THE BUILDING.
FROM BACKFLOW PREVENTER OR SUPPLY MANIFOLD
AS APPLICABLE: TO NEXT SYSTEM RISER ON MANIFOLD (IF APPLICABLE)
STANCHION BOLTED TO EQUIPMENT FITTINGS AND ANCHORED TO FLOOR

06 WET SYSTEM RISER
12" = 1'-0"


INDICATING VALVE
TO BACKFLOW PREVENTER
ENTRANCE FLANGE
FINISH GRADE
(PER SPECIFICATIONS)
5'-6" MIN.
FOUNDATION WALL
FLOOR SLAB
WATERTIGHT PIPE SLEEVE PENETRATION ASSEMBLY
HEAVY DUTY UNDERGROUND PIPE CLAMP SUITABLE FOR BURIED PIPE (TYP.)
FROM SITE UTILITIES
RESTRAINED MECHANICAL JOINT FITTINGS (TYPICAL)
CONNECTION POINT TO SITE UTILITIES VIA RESTRAINED MECHANICAL JOINT COUPLING
HEAVY DUTY UNDERGROUND PIPE CLAMP SUITABLE FOR BURIED PIPE (TYP.)
WATERTIGHT PIPE SLEEVE PENETRATION ASSEMBLY

07 FIRE SERVICE ENTRANCE
12" = 1'-0"

Project:
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WELL 10 AND 11 PUMPING AND TRATMENT DESIGN MILL HILL ROAD CHATHAM, MA 02633

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Date:	03 / 28 / 2022
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Approved By:	MER
W&S Project No.:	ENG21 - 1001
W&S File No.:	TBD

Drawing Title:
FIRE PROTECTION DETAILS

Sheet Number:
FP501

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ABBREVIATIONS

Ø	DIAMETER	ID	INSIDE DIAMTER
ABV	ABOVE	IN	INCH
ACT	ACOUSTICAL CEILING TILE	INV	INVERT
AD	ACCESS DOOR	KW	KILOWATT
ADD	ADDENDUM	L	LENGTH
ADDL	ADDITIONAL	LAV	LAVATORY-FIXTURE
AFF	ABOVE FINISHED FLOOR	LB	POUND
AFR	ABOVE FINSIHED ROOF	LF	LINEAR FEET
ALT	ALTERNATE	LP	LOW POINT
AP	ACCESS PANEL	LPC	LIMIT OF PLUMBING CONTRACTOR
ARCH	ARCHITECT/ARCHITECTURAL	LPG	LIQUEFIED PETROLEUM GAS
AVG	AVERAGE	MAX	MAXIMUM
BFC	BELOW FINSIHED CEILING	MECH	MECHANICAL
BFF	BELOW FINISHED FLOOR	MEZZ	MEZZANINE
BFP	BACKFLOW PREVENTER	MFR	MANUFACTURER
BLDG	BUILDING	MIN	MINIMUM
BOP	BOTTOM OF PIPE	MISC	MISCELLANEOUS
BOS	BOTTOM OF STEEL	MTR	MOTOR
BSMT	BASEMENT	MU	MAKE-UP WATER
CA	COMPRESSED AIR	N/A	NOT APPLICABLE
CI	CAST IRON	NB	NICKEL BRONZE
CL	CENTERLINE	NC	NORMALLY CLOSED
CLG	CEILING	NIC	NOT IN CONTRACT
CO	CLEAN OUT	NG	NATURAL GAS
COL	COLUMN	NO	NUMBER
CONC	CONCRETE	NO	NORMALLY OPEN
CONT	CONTINUATION	NTS	NOT TO SCALE
CONTR	CONTRACTOR	OC	ON CENTER
CONN	CONNECTION	OCC	OCCUPIED
CP	CHROME PLATED	OD	OUTSIDE DIAMETER
CTW	CONNECT TO EXISITNG	P	PUMP
CW	COLD WATER	PC	PLUMBING CONTRACTOR
D	DRAIN	PH	PHASE
DEG	DEGREE	PLBG	PLUMBING
DIA	DIAMETER	POS	PROVIDED BY OTHER SECTION
DIM	DIMENSION	PRESS	PRESSURE
DN	DOWN	PRV	PRESSURE REDUCING VALVE
DWG	DRAWING	PSI	POUNDS PER SQUARE INCH
EA	EACH	PSIG	PSI GAUGE
EC	ELECTRICAL CONTRACTOR	PWR	POWER
ELEC	ELECTRICAL	QTY	QUANTITY
ELEV	ELEVATION	R	RADIUS
EQUIP	EQUIPMENT	RM	ROOM
ET	EXPANSION TANK	RPM	REVOLUTIONS PER MINUTE
EVAP	EVAPORATOR	SA	SHOCK ABSORBER
EWH	ELECTRIC WATER HEATER	SF	SQUARE FOOT
EXIST	EXISTING	SPECS	SPECIFICAITONS
FA	FREE AREA	SS	STAINLESS STEEL
FC	FLEXIBLE CONNECTION	TOP	TOP OF PIPE
FCO	FLOOR CLEANOUT	TOS	TOP OF STEEL
FFE	FINISHED FLOOR ELEVATION	TOT	TOTAL
P-#	FIXTURE NUMBER	TYP	TYPICAL
FL	FLOOR	U	URINAL-FIXTURE IDENTIFICATION
FS	FLOW SWITCH	UG	UNDERGROUND
FT	FOOT/FEET	UNO	UNLESS NOTED OTHERWISE
FV	FLUSH VALVE	V	VENT
G	GAS	V	VENT STACK
GA	GAUGE	V	VOLTS
GAL	GALLON	VEL	VELOCITY
GALV	GALVANIZED	VFD	VARIABLE FREQUENCY DRIVE
GC	GENERAL CONTRACTOR	VTR	VENT THROUGH ROOF
GWH	GAS WATER HEATER	W	WASTE
GPH	GALLONS PER HOUR	WH	WALL HYDRANT
GPM	GALLONS PER MINUTE	W	WIDTH
GRD	GRADE	W/	WITH
GWB	GYPSUM WALL BOARD	W/O	WITHOUT
HB	HOSE BIB	WC	WATER CLOSET-FIXTURE
HC	HANDICAPPED	WG	WATER GAUGE
HD	HEAD	°F	DEGREES FAHRENHEIT
HP	HORSE POWER		
HP	HIGH POINT		
HR	HOUR		
HT	HEIGHT		
HTG	HEATING		
HTR	HEATER		
HW	HOT WATER		
HWR	HOT WATER RETURN		

PLUMBING GENERAL NOTES

1. PLUMBING GENERAL NOTES APPLY TO ALL PLUMBING DRAWINGS. THE WORD "CONTRACTOR" USED IN "PLUMBING" WORK SHALL MEAN THE PLUMBING OR PLUMBING CONTRACTOR.
2. LOCATIONS OF PIPING AND EQUIPMENT AS INDICATED ON THE DRAWING, ARE APPROXIMATE AND SUBJECT TO MINOR ADJUSTMENTS IN THE FIELD. WORK SHALL BE COORDINATED WITH ALL OTHER TRADES TO AVOID INTERFERENCE IN THE FIELD.
3. ALL WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING AND TRANSITIONS AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
4. VERIFY ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. VERIFY AND PROVIDE PIPE TRANSITIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DIMENSIONS BEFORE FABRICATION.
5. ALL MATERIALS AND EQUIPMENT UNLESS SPECIFICALLY INDICATED AS REUSED, SHALL BE NEW.
6. ACCESS PANELS SHALL BE FURNISHED TO ALLOW FOR SERVICING TRAP PRIMERS AND ALL CONCEALED PLUMBING EQUIPMENT TO BE INSTALLED GENERAL CONTRACTOR.
7. WHEN SECTION OF PIPING IS NOT LABELED FOR SIZE, THE LARGER SIZE INDICATED ON THE CONNECTED PIPE SHALL PREVAIL.
8. THE FIRE PROOFING OF THE BUILDING STRUCTURE IS NOT TO BE REMOVED FOR THE INSTALLATION OF HANGERS, SUPPORTS, PIPING, ETC. IF FIRE PROOFING IS DAMAGED, IT SHALL BE REPAIRED AT THE EXPENSE OF THE TRADE.
9. THE CONTRACTOR SHALL TEST AND CALIBRATE ALL CONTROLS AND VERIFY ALL ARE FULLY FUNCTIONAL AND SUBMIT DOCUMENTATION. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
10. THE CONTRACTOR SHALL PROVIDE AND SUBMIT DOCUMENTATION FOR PIPING PRESSURE AND LEAKAGE TESTS, OPERATING AND MAINTENANCE MANUALS, AND AS BUILT DRAWINGS. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
11. REFER TO THE PROJECT SPECIFICATIONS FOR FURTHER REQUIREMENTS.
12. MANY EQUIPMENT SCHEDULES DO NOT LIST QUANTITIES. CONTRACTOR SHALL REFER TO ALL DRAWINGS AND PROVIDE THE REQUIRED QUANTITIES FOR ALL COMPONENTS.
13. IN ACCORDANCE WITH SPECIFICATION 22 00 50, THE CONTRACTOR SHALL COORDINATE WITH ALL TRADES AND PREPARE COORDINATION DRAWINGS PRIOR TO INSTALLATION. COORDINATION DRAWINGS SHALL BE SUBMITTED TO THE OWNERS REPRESENTATIVE FOR REVIEW PRIOR TO INSTALLATION.
14. FINAL PRODUCT SHALL BE A COMPLETE AND FUNCTIONING SYSTEM, AND SHALL CONFORM TO ALL REQUIREMENTS OF APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING BUT NOT LIMITED TO THE INTERNATIONAL BUILDING CODE AND INTERNATIONAL PLUMBING CODE

PLUMBING PIPING NOTES

1. FIELD VERIFY ALL WATER, WASTE, VENT, COMPRESSED AIR, AND GAS PIPING CONNECTIONS AND PROVIDE NEW CONNECTIONS AS REQUIRED FOR PROPERLY OPERATING SYSTEMS.
2. RUN WATER PIPE ON THE WARM SIDE OF BUILDING INSULATION. NO WATER PIPING SHALL BE RUN IN EXTERIOR WALLS.
3. PROVIDE DRAWOFFS WITH BALL VALVE, HOSE END VACUUM BREAKER, CAP AND CHAIN AT ALL DOMESTIC WATER LOW POINTS AND PITCH PIPING TO DRAIN.
4. PROVIDE SHOCK ABSORBERS AS SHOWN ON DRAWINGS AND AS REQUIRED TO AVOID WATER HAMMER. SIZE SHALL CONFORM TO P.D.I. STANDARDS.
5. PROVIDE ISOLATION VALVES AT ALL PLUMBING FIXTURES.
6. HOT WATER TAKEOFFS SHALL HAVE NOT LESS THAN THREE ELBOW SWINGS.
7. ALL PIPING SHALL BE SUPPORTED FROM BUILDING STRUCTURES. INSTALL HORIZONTAL RUNS OF WATER AND COMPRESSED AIR PIPING AS HIGH AS POSSIBLE OR AS INDICATED ON DRAWINGS.
8. ROUTE DOMESTIC WATER AND SANITARY SEWER SERVICES TO SITE UTILITIES 10'-0" FROM BUILDING, UNLESS NOTED OTHERWISE. FIELD VERIFY LOCATION AND INVERTS OF SITE UTILITIES PRIOR TO INSTALLATION OF PIPING.
9. MINIMUM PITCH FOR SANITARY PIPING 4" AND GREATER SHALL BE AT 1/8" PER FOOT. MINIMUM PITCH FOR SANITARY PIPING 3" AND SMALLER SHALL BE AT 1/4" PER FOOT.
10. ALL INVERT ELEVATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY AND SHALL BE DETERMINED IN FIELD IN COORDINATION WITH THE STRUCTURAL AND CIVIL DRAWINGS. REFER TO CIVIL PLANS FOR SITE CONNECTIONS.
11. PLUMBING CONTRACTOR IS RESPONSIBLE FOR OIL WATER SEPARATOR, COORDINATE WITH CIVIL FOR LOCATION. PROVIDE OIL WASTE AND VENT PIPING BETWEEN THE BUILDING AND SEPARATOR.
12. WASTE AND VENT PIPING UNDERGROUND BELOW SLAB AND THROUGH THE SLAB SHALL BE 2" MINIMUM.
13. PROVIDE CLEANOUTS IN ACCESSIBLE LOCATIONS AT THE BASE OF ALL PLUMBING RISERS, WHERE SHOWN ON THE PLANS AND REQUIRED BY THE CODE.
14. DIELECTRIC INSULATING FITTINGS SHALL BE USED WHERE PIPES OF DISSIMILAR METALS ARE CONNECTED.
15. AN AIR GAP OF AT LEAST TWICE THE EFFECTIVE DIAMETER OF THE DRAIN SERVICED SHALL BE PROVIDED ON ALL EQUIPMENT DRAINS PIPED TO FLOOR DRAINS.
16. PROVIDE P-TRAPS AND TRAP PRIMERS FOR ALL FLOOR DRAINS, FLOOR SINKS, AND TRENCH DRAINS, UNLESS INDICATED OTHERWISE. PROVIDE 1/2" COLD WATER TUBING UNDER SLAB FROM TRAP PRIMER TO FLOOR DRAINS (THIS TUBING IS NOT SHOWN ON THE PLANS).
17. FOR ALL PIPING SIZES NOT SHOWN ON PLANS REFER TO DETAILS AND DIAGRAMS. WHEN SECTION OF PIPING IS NOT LABELED FOR SIZE, THE LARGER SIZE INDICATED ON THE CONNECTED PIPE SHALL PREVAIL.

CALLOUT SYMBOLS

- CONNECT TO EXISTING
- LIMIT OF DEMOLITION
- SECTION DESIGNATION (A / H2.0)
- SECTION SHEET NUMBER
- 1 — REVISION NUMBER
- REMOVE EXISTING ITEM
- WC-XX — FIXTURE TAG (REFER TO SCHEDULES FOR DETAILS)

NOTE: SOME OR ALL SYMBOLS MAY BE USED ON THIS PROJECT

PIPING LEGEND

- GATE VALVE (OUTSIDE SCREW AND YOKE UNLESS SPECIFIED OTHERWISE)
- BALL VALVE
- BUTTERFLY VALVE
- DRAIN VALVE WITH CAP AND CHAIN
- PLUG VALVE
- PRESSURE REDUCING VALVE
- CHECK VALVE (SILENT TYPE ON PUMP DISCHARGE)
- STRAINER WITH HOSE END BLOWOFF VALVE, CAP AND CHAIN
- RELIEF/SAFETY VALVE
- UNION
- BLIND FLANGE
- PIPE - CAPPED
- DIRECTION OF FLOW
- FLEXIBLE CONNECTOR
- PIPE CONNECTION - TOP
- PIPE CONNECTION - BOTTOM
- PIPE - DOWN
- PIPE - UP
- R — PITCH OF PIPE - (R) RISE OR (D) DROP
- REDUCER - CONCENTRIC
- REDUCER - ECCENTRIC
- QUICK CLOSING VALVE, FUSIBLE LINK (USED WITH FUELS)
- PIPE BREAK (SINGLE LINE)
- DIRT LEG
- CO — CLEANOUT
- PIPE - UP (DOUBLE LINE)
- PIPE - DOWN (DOUBLE LINE)
- PIPE BREAK (DOUBLE LINE)
- FLOOR DRAIN
- TP — TRAP PRIMER
- FCO FLOOR CLEANOUT
- P-TRAP
- HB — HOSE BIBB (INTERIOR)
- WH — WALL HYDRANT (EXTERIOR)
- CAO — COMPRESSED AIR OUTLET

NOTE: SOME OR ALL SYMBOLS MAY BE USED ON THIS PROJECT

PIPING ABBREVIATIONS

CA	COMPRESSED AIR
CW	COLD WATER
G	NATURAL GAS
LPG	LIQUID PROPANE GAS
HW	HOT WATER
HW 140	HOT WATER 140
HW-R	HOT WATER RECIRCULATION
HW-R 140	HOT WATER RECIRCULATION 140
OW	OIL WASTE ABOVE GROUND
OW	OIL WASTE UNDERGROUND
OV	OIL VENT ABOVE GROUND
OV	OIL VENT UNDERGROUND
W	SOIL OR WASTE ABOVE GROUND
W	SOIL OR WASTE UNDERGROUND
SD	STORM DRAINAGE ABOVE GROUND
SD	STORM DRAINAGE UNDERGROUND
OSD	OVERFLOW STORM DRAINAGE
TW	TEMPERED WATER
TWR	TEMPERED WATER RETURN
TP	TRAP PRIMER ABOVE GROUND
TP	TRAP PRIMER UNDERGROUND
V	VENT ABOVE GROUND
V	VENT UNDERGROUND
(NAME)	REMOVE EXISTING PIPING

NOTE: SOME OR ALL SYMBOLS MAY BE USED ON THIS PROJECT

Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD CHATHAM, MA 02633

WELL 10 AND 11 PUMPING AND TREATMENT DESIGN
MILL HILL ROAD CHATHAM, MA 02633

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Revisions:

No.	Date	Description

COA:

Seal: COMMONWEALTH OF MASSACHUSETTS — MARY ELIZABETH REDDY — MECHANICAL — No. 38123 — REGISTERED PROFESSIONAL ENGINEER

Issued For: BID

Scale: NTS

Key Plan:

Date:	MARCH 30, 2022
Drawn By:	DRB
Reviewed By:	MER
Approved By:	MER
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title: PLUMBING LEGENDS, NOTES AND ABBREVIATIONS

Sheet Number: P000

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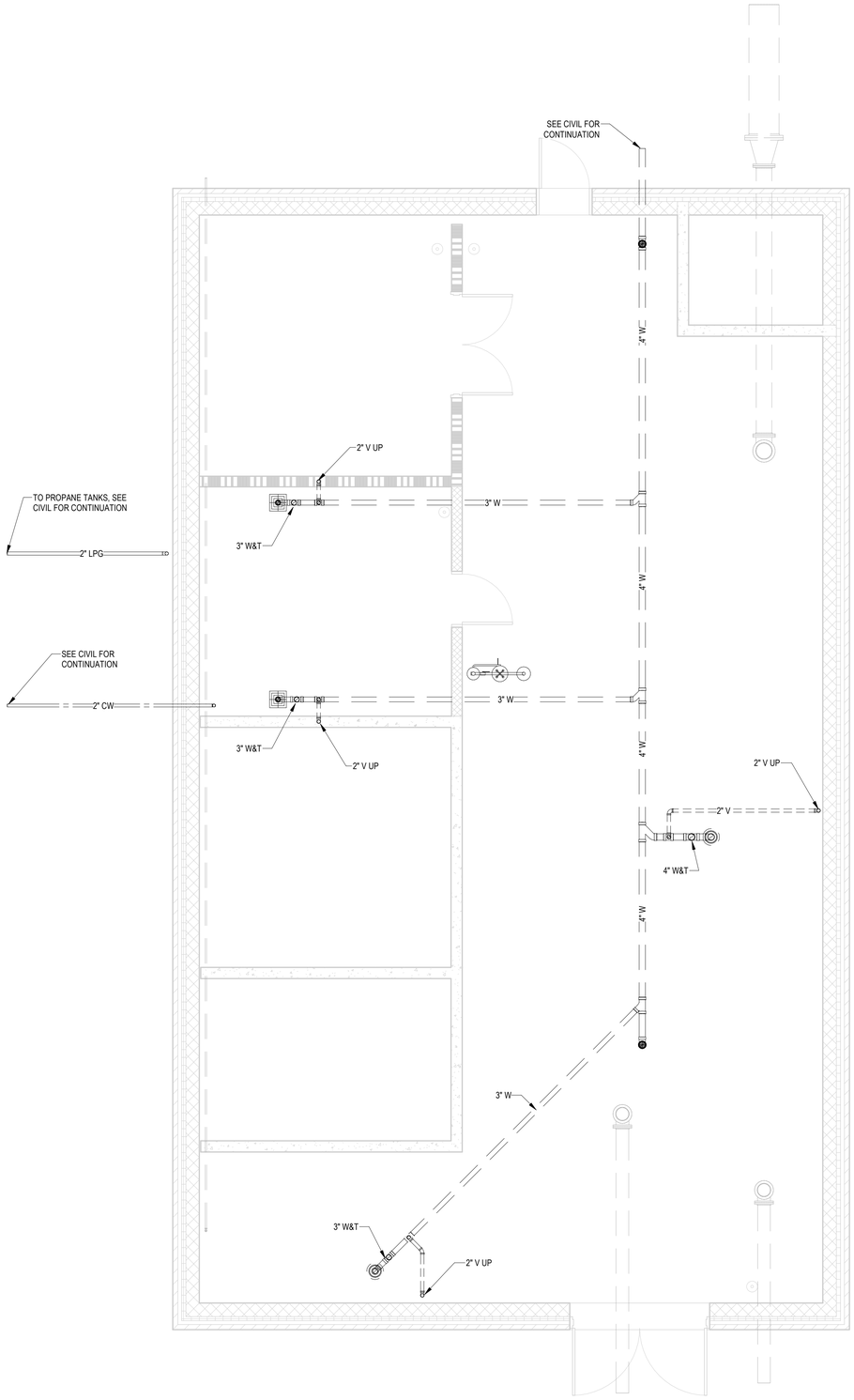
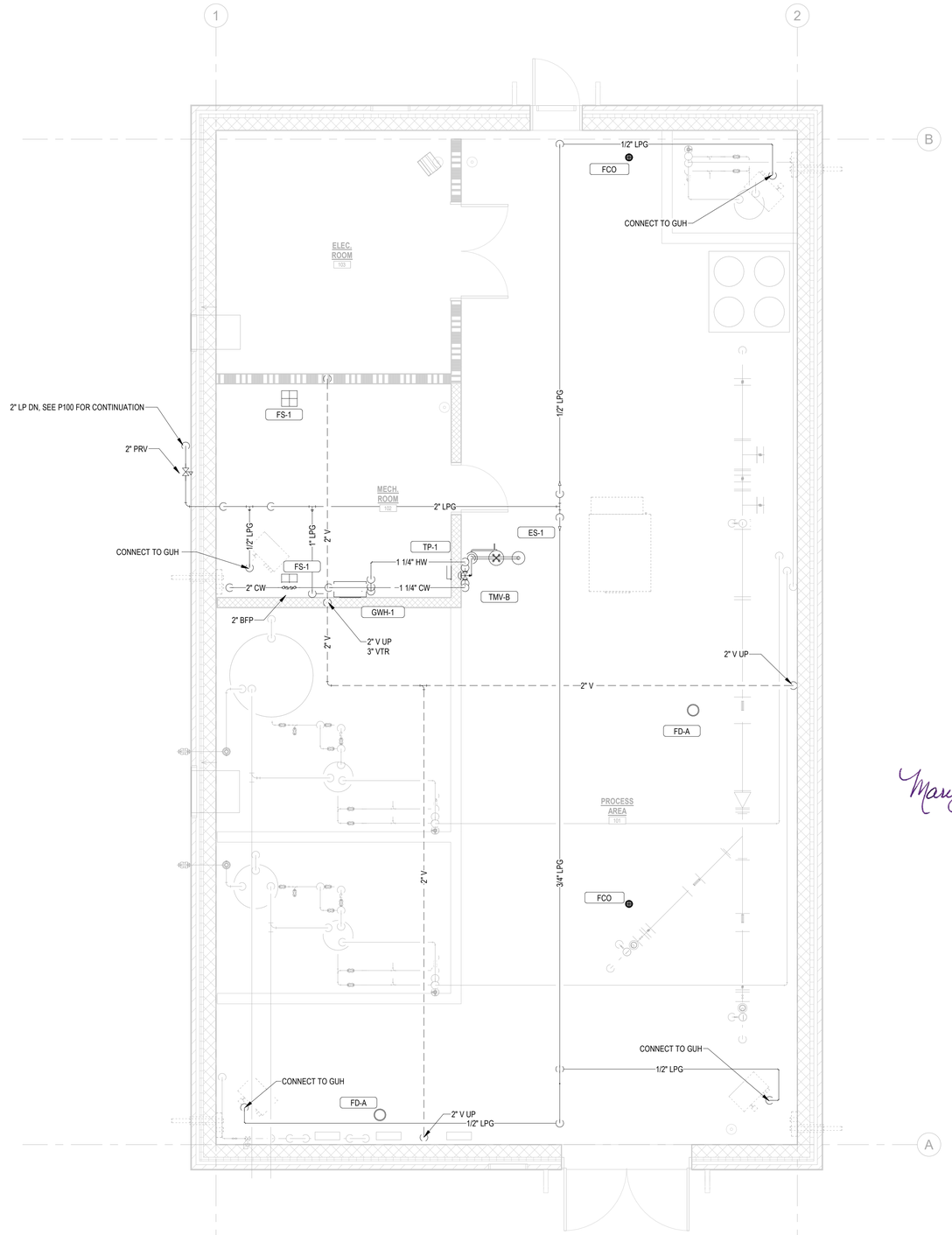


2 UNDERGROUND PLUMBING PLAN
1/4" = 1'-0"
0 2' 4' 8'



1 PLUMBING PIPING PLAN
1/4" = 1'-0"
0 2' 4' 8'

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MARY ELIZABETH REDDY
MECHANICAL
No. 38123
REGISTERED PROFESSIONAL ENGINEER

Issued For:
BID

Scale: 1/4" = 1'-0"

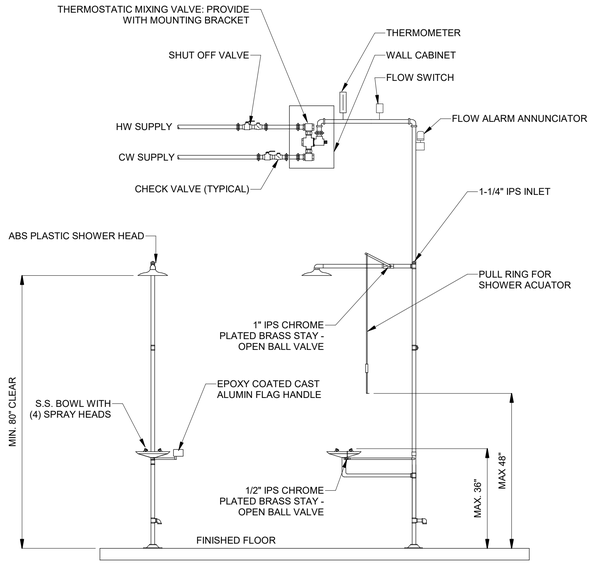
Key Plan:

NORTH

Date:	MARCH 30, 2022
Drawn By:	DRB
Reviewed By:	AI
Approved By:	MER
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

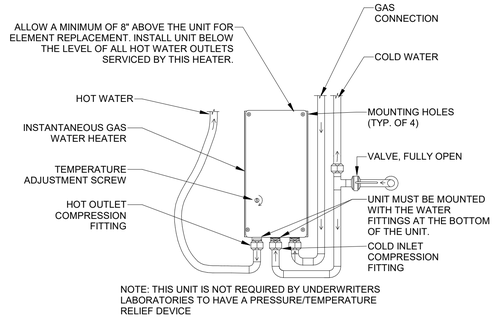
Drawing Title:
UNDERGROUND AND FIRST FLOOR PLUMBING PLAN

Sheet Number:
P101



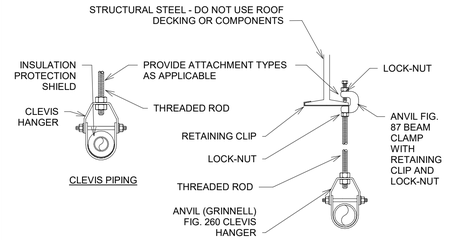
NOTE:
1. PROVIDE A LOOSE-KEY LOCKSHIELD TYPE SHUT-OFF VALVE IN DOMESTIC WATER SUPPLY DROP TO EYEWASH. LABEL VALVE TO PREVENT UNAUTHORIZED SHUT-OFF.

1 P501 EMERGENCY EYEWASH SHOWER
NOT TO SCALE

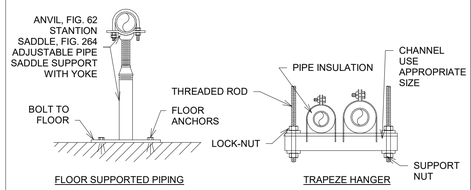

ALLOW A MINIMUM OF 8" ABOVE THE UNIT FOR ELEMENT REPLACEMENT. INSTALL UNIT BELOW THE LEVEL OF ALL HOT WATER OUTLETS SERVICED BY THIS HEATER.
GAS CONNECTION
COLD WATER
HOT WATER
MOUNTING HOLES (TYP. OF 4)
INSTANTANEOUS GAS WATER HEATER
VALVE, FULLY OPEN
TEMPERATURE ADJUSTMENT SCREW
UNIT MUST BE MOUNTED WITH THE WATER FITTINGS AT THE BOTTOM OF THE UNIT.
HOT OUTLET COMPRESSION FITTING
COLD INLET COMPRESSION FITTING

NOTE: THIS UNIT IS NOT REQUIRED BY UNDERWRITERS LABORATORIES TO HAVE A PRESSURE/TEMPERATURE RELIEF DEVICE

2 P501 INSTANTANEOUS GAS WATER HEATER
NOT TO SCALE

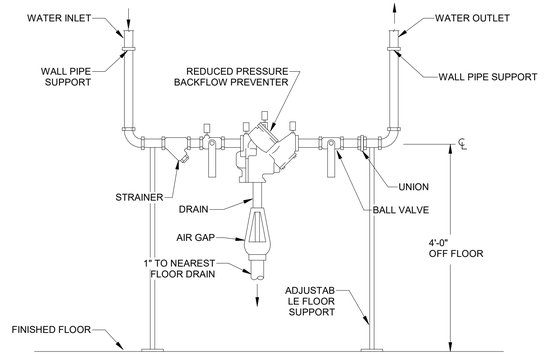


NOTE:
CLAMPS, ATTACHMENTS, ETC. ARE TO BE ATTACHED TO STRUCTURAL SUPPORT ONLY. DO NOT ATTACH, AFFIX OR SUPPORT FROM THE ROOF DECKING OR COMPONENTS.



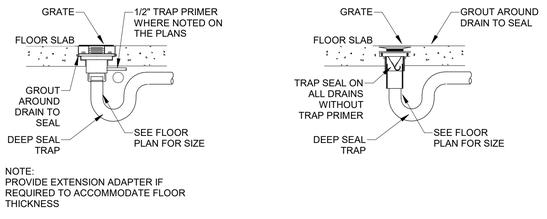
NOTES:
1. SIZE HANGER RODS AND ANCHORS TO ADEQUATELY SUPPORT LOADS. REFER TO MANUFACTURERS RECOMMENDATIONS.
2. PROVIDE HANGERS SUITABLE FOR AWWA DUCTILE IRON PIPE FOR SANITARY AND STORM PIPING.
3. INSULATION SHEILDS TO BE GALVANIZED STEEL.

6 P501 TYPICAL PIPE HANGER AND SUPPORT DETAIL
NOT TO SCALE



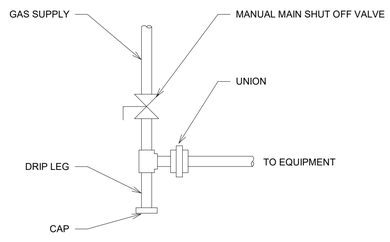
NOTES:
1. FURNISH TO OWNER ONE TEST KIT AND SPARE PARTS KIT.
2. THIS CONTRACTOR SHALL ACT AS THE OWNERS AGENT IN SEEKING APPROVAL FROM ALL LOCAL AND STATE AUTHORITIES. THIS CONTRACTOR SHALL SUBMIT ALL PLANS, SPECS AND APPLICATIONS REQUIRED FOR APPROVAL AND PAY ALL FEES.
3. SEE FLOOR PLAN FOR SIZES.
4. MAINTAIN 1'-0" CLEARANCE FROM WALL.
5. TEST AND CERTIFY EACH INSTALLATION.

3 P501 BACKFLOW PREVENTER DETAIL
NOT TO SCALE

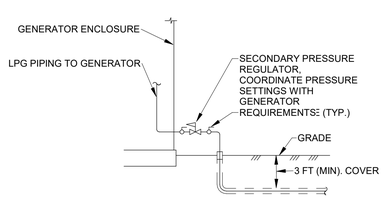

GRATE
1/2" TRAP PRIMER WHERE NOTED ON THE PLANS
FLOOR SLAB
GROUT AROUND DRAIN TO SEAL
DEEP SEAL TRAP
SEE FLOOR PLAN FOR SIZE
GRATE
GROUT AROUND DRAIN TO SEAL
FLOOR SLAB
TRAP SEAL ON ALL DRAINS WITHOUT TRAP PRIMER
DEEP SEAL TRAP
SEE FLOOR PLAN FOR SIZE

NOTE:
PROVIDE EXTENSION ADAPTER IF REQUIRED TO ACCOMMODATE FLOOR THICKNESS

4 P501 FLOOR DRAIN DETAIL
NOT TO SCALE



5 P501 GAS PIPING EQUIPMENT CONNECTION DETAIL
NOT TO SCALE


GENERATOR ENCLOSURE
LPG PIPING TO GENERATOR
SECONDARY PRESSURE REGULATOR, COORDINATE PRESSURE SETTINGS WITH GENERATOR REQUIREMENTS (TYP.)
GRADE
3 FT (MIN). COVER

7 P501 PROPANE PIPING DIAGRAM AT GENERATOR
NOT TO SCALE

Project:
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Drawn By:	DRB
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Approved By:	MER
W&S Project No.:	ENG21-1001
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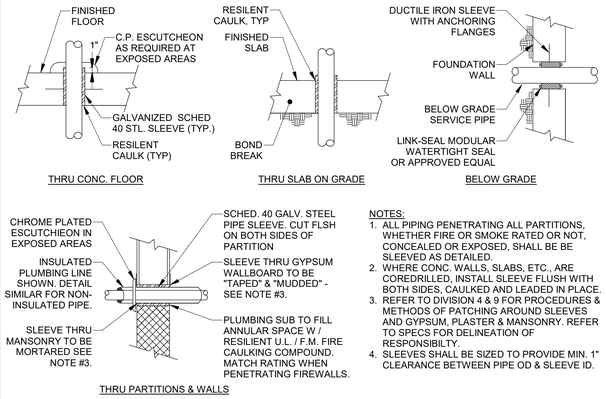
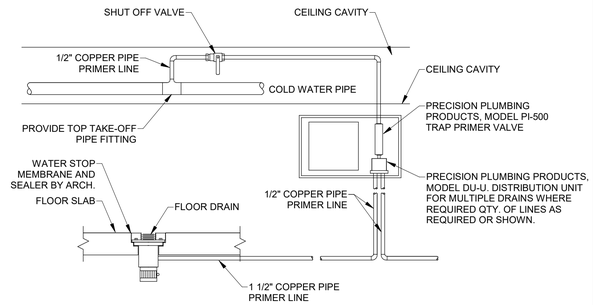

FINISHED FLOOR
1"
C.P. ESCUTCHEON AS REQUIRED AT EXPOSED AREAS
GALVANIZED SCHED 40 STL. SLEEVE (TYP.)
RESILENT CAULK (TYP)
THRU CONC. FLOOR
RESILENT CAULK, TYP
FINISHED SLAB
BOND BREAK
THRU SLAB ON GRADE
DUCTILE IRON SLEEVE WITH ANCHORING FLANGES
FOUNDATION WALL
BELOW GRADE SERVICE PIPE
LINK-SEAL MODULAR WATERTIGHT SEAL OR APPROVED EQUAL
BELOW GRADE
CHROME PLATED ESCUTCHEON IN EXPOSED AREAS
INSULATED PLUMBING LINE SHOWN. DETAIL SIMILAR FOR NON-INSULATED PIPE.
SLEEVE THRU MANSONRY TO BE MORTARED SEE NOTE #3.
SCHED. 40 GALV. STEEL PIPE SLEEVE. CUT FLSH ON BOTH SIDES OF PARTITION
SLEEVE THRU GYPSUM WALLBOARD TO BE "TAPED" & "MUDDED" - SEE NOTE #3.
PLUMBING SUB TO FILL ANNULAR SPACE W / RESILIENT U.L. / F.M. FIRE CAULKING COMPOUND. MATCH RATING WHEN PENETRATING FIREWALLS.
THRU PARTITIONS & WALLS

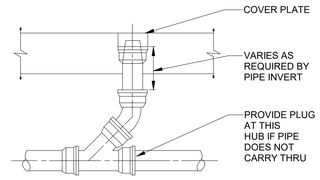
NOTES:
1. ALL PIPING PENETRATING ALL PARTITIONS, WHETHER FIRE OR SMOKE RATED OR NOT, CONCEALED OR EXPOSED, SHALL BE BE SLEEVED AS DETAILED.
2. WHERE CONC. WALLS, SLABS, ETC., ARE COREDRILLED, INSTALL SLEEVE FLUSH WITH BOTH SIDES, CAULKED AND LEADED IN PLACE.
3. REFER TO DIVISION 4 & 9 FOR PROCEDURES & METHODS OF PATCHING AROUND SLEEVES AND GYPSUM, PLASTER & MANSONRY. REFER TO SPECS FOR DELINEATION OF RESPONSIBILTY.
4. SLEEVES SHALL BE SIZED TO PROVIDE MIN. 1" CLEARANCE BETWEEN PIPE OD & SLEEVE ID.

1 P502 TYPICAL PLUMBING SLEEVE CONDITIONS
NOT TO SCALE

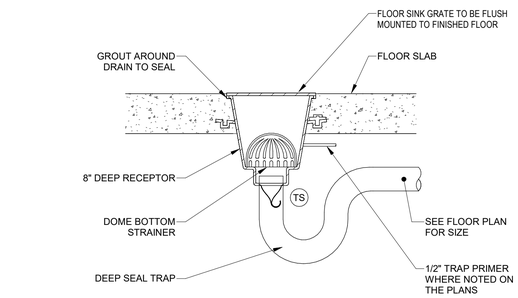
NOTE:
1. PROVIDE ACCESS PANEL OR INSTALL IN ACCESSIBLE SPACE FOR TRAP PRIMERS AND DISTRIBUTION UNITS.
2. PRODUCTS INDICATED ARE BASIS OF DESIGN, EAQUAL PRODUCTS WILL BE CONSIDERED.


SHUT OFF VALVE
CEILING CAVITY
1/2" COPPER PIPE PRIMER LINE
CEILING CAVITY
COLD WATER PIPE
PRECISION PLUMBING PRODUCTS, MODEL PI-500 TRAP PRIMER VALVE
PROVIDE TOP TAKE-OFF PIPE FITTING
WATER STOP MEMBRANE AND SEALER BY ARCH.
FLOOR SLAB
FLOOR DRAIN
1/2" COPPER PIPE PRIMER LINE
PRECISION PLUMBING PRODUCTS, MODEL DU-U. DISTRIBUTION UNIT FOR MULTIPLE DRAINS WHERE REQUIRED QTY. OF LINES AS REQUIRED OR SHOWN.
1 1/2" COPPER PIPE PRIMER LINE

2 P502 TRAP PRIMER DETAIL
NOT TO SCALE



3 P502 CLEAN OUT AND PLUGGED RISER
NOT TO SCALE


FLOOR SINK GRATE TO BE FLUSH MOUNTED TO FINISHED FLOOR
GROUT AROUND DRAIN TO SEAL
FLOOR SLAB
8" DEEP RECEPTOR
TS
DOME BOTTOM STRAINER
SEE FLOOR PLAN FOR SIZE
DEEP SEAL TRAP
1/2" TRAP PRIMER WHERE NOTED ON THE PLANS

4 P502 FLOOR SINK
NOT TO SCALE

Project:
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PLUMBING FIXTURE SCHEDULE

SYMBOL	FIXTURE					FITTING			TRAP	CARRIER	FLOW RATE	REMARKS
	TYPE	MANUFACTURER	MODEL	DESCRIPTION	SIZE	MANUFACTURER	TYPE	SUPPLY				
HB-1	HOSE BIBB (FINISHED SPACE)	WOODFORD	40SC	N/A	N/A	WOODFORD	CHROME PLATED WALL MOUNTED SILL FITTING W/VB AND T HANDLE	1/2" CW	N/A	N/A	N/A	PROVIDE WITH INTEGRAL VACUUM BREAKER
ES-1	EMERGENCY EYEWASH / SHOWER COMBINATION	GUARDIAN	G19090PCC	COMBINATION WIDE AREA EYE/FACE WASH AND SHOWER SAFETY STATION	10" SHOWER HEAD 11-1/8" BOWL	N/A	N/A	1-1/4" TW	N/A	N/A	20 GPM	POLISHED CHROME CONSTRUCTION, POWDER COATED CAST ALUMINUM FLOOR FLANGE, POWDER COATED CAST ALUMINUM FLAG HANDLE, STAINLESS STEEL SHOWER PULL HANDLE, SHOWER HEAD, AND ACTUATING ARM
WH-1	WALL HYDRANT (EXTERIOR)	WOODFORD	B67	BOX TYPE BACKFLOW PROTECTED, FREEZELESS WALL HYDRANT	6-1/2" X 7-1/2" X 7-3/8" DEEP	N/A	N/A	3/4" CW	N/A	N/A	N/A	LOOSE TEE KEY OPERATION. HARDENED STAINLESS STEEL OPERATING STEM.

REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION
ALL PLUMBING FIXTURES AND EQUIPMENT SHALL BE MASSACHUSETTS PLUMBING BOARD APPROVED

PLUMBING DRAIN SCHEDULE

SYMBOL	TYPE	MANUFACTURER	MODEL	OUTLET	STRAINER	LOCATION	REMARKS
FD-A	FLOOR DRAIN	JR SMITH	2110Y-B	NO HUB	8-1/2" ROUND CAST IRON		CAST IRON BODY, FLASHING COLLAR, TRAP PRIMER CONNECTION
FS-1	FLOOR SINK	WATTS	FS-740	NO HUB	STAINLESS STEEL DOME	MECHANCIAL ROOM	WHITE PORCELAIN ENAMEL COATED INTERIOR, LOOSE SET PORCELAIN COATED CAST IRON GRATE
FCO-A	FLOOR CLEANOUT	JR SMITH	4220	NO HUB	EXTRA HEAVY DUTY CAST IRON CLEAN OUT		CAST IRON BODY, ROUND NICKEL BRONZE TOP WITH THREADED SPANNER WRENCH COVER, TWIST TO FLOOR ADJUSTMENT

NOTES:
1. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION
2. BEFORE SETTING DRAINS, OBTAIN EXACT INFORMATION RELATIVE TO FINISH FLOOR LEVEL, FLOOR CONSTRUCTION AND SET TOP OF DRAINS AT FINISH FLOOR LEVEL.
3. SIZE OF DRAINS IS INDICATED ON THE DRAWINGS.

MIXING VALVE SCHEDULE

SYMBOL	MANUFACTURER	MODEL	LOCATION	INLET TEMPERATURE (°F)	OUTLET TEMPERATURE (°F)	GPM	DELTA P AT GPM	MIN RATED GPM	INLET SIZE	OUTLET SIZE	REMARKS
TMV-B	GUARDIAN	G3800LF	SEE PLANS	140	60	40	35	56	1"	1-1/4"	BRASS VALVE BODY WITH (2) 1" NPT BRASS BALL VAVLES, OUTLET TEMPERATURE GAUGE, INTEGRAL CARTRIDGE STYLE CHECKS WITH SCREEN, BUILT-IN COLD WATER BYPASS, ADJUSTABLE HIGH TEMPERATURE LIMIT

REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION

GAS-FIRED WATER HEATER SCHEDULE

ID	MANUFACTURER	MODEL NO.	TYPE	GAS-FIRED HEAT EXCHANGER								UNIT WEIGHT (lb)	ELECTRICAL DATA			REMARKS
				GAS BURNER					WATERSIDE							
						FUEL			FLOW	STORAGE						
				MIN INPUT (MBH)	MAX INPUT (MBH)	TYPE	MIN (IN WC)	MAX (IN WC)	DESIGN (GPM)	RECOVERY	VOL (GAL)	MAX TEMP RISE		FLA	VOLT	PH	
GWH-1	AO Smith	ATIO-910-P	INSTANTANEOUS	15.0	380.0	LP	8.0	14.0	6	0	0.0	100	113.00	1.48	120	1	1

1. PROVIDE FACTORY COMBUSTION AIR INTAKE KIT

TRAP PRIMER SCHEDULE

SYMBOL	MANUFACTURER	MODEL	PIPE SIZE	ACTIVATION TYPE	MOUNT TYPE	REMARKS
TP-1	ZURN	Z1020	1/2"	24V	SURFACE	LOW VOLTAGE(24VAC) WITH LED INDICATOR, PERMANENTLY PROGRAMMED ELECTRONIC TIMER (24 HOUR INTERVAL), MANUAL OVERRIDE AND TESTING PUSH BUTTON, FACTORY HEADER WITH 5 OUTLETS, FACTORY INTEGRAL STRAINER, VACUUM BREAKER, COPPER WATER INLET WITH BRASS BALL VALVE, SURFACE MOUNTED GALVANIZED STEEL COVER AND BOX, FACTORY ASSEMBLED AND TESTED, TRANSFORMER, UL APPROVED COMPONENTS.

REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION

PROPANE GAS LOAD SUMMARY SCHEDULE

TAG	QTY	APPLIANCE	INPUT (CFH)	SUBTOTAL (CFH)	REQ'D PRESSURE (IN WC)	LOCATION
GEN-1	1	GENERATOR	477			
GWH-1	1	DOMESTIC WATER HEATER	152	152	7" - 14"	MECHANICAL ROOM
GUH-1	3	GAS UNIT HEATER	18	54	7" - 14"	
GUH-2	1	GAS UNIT HEATER	12	12	7" - 14"	
			TOTAL (CFH)	**218**		
PIPE TO BUILDING BASED ON A MAXIMUM DISTANCE OF 200' (350 EQUIVALENT FEET) @ 11" W.C. PSI OR LESS INLET PRESSURE AND 0.5" WC PRESSURE DROP.			PIPE SIZE	2"		

PROPANE GAS GENERATOR LOAD SUMMARY SCHEDULE

TAG	QTY	APPLIANCE	INPUT (CFH)	SUBTOTAL (CFH)	REQ'D PRESSURE (IN WC)	LOCATION
GEN-1	1	GENERATOR	477			
			TOTAL (CFH)	**0**		
PIPE TO BUILDING BASED ON A MAXIMUM DISTANCE OF 200' (350 EQUIVALENT FEET) @ 11" W.C. PSI OR LESS INLET PRESSURE AND 0.5" WC PRESSURE DROP.			PIPE SIZE	3		

Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD CHATHAM, MA 02633

WELL 10 AND 11 PUMPING AND TREATMENT DESIGN
MILL HILL ROAD CHATHAM, MA 02633

Weston & Sampson
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Consultants:

Revisions:

No.	Date	Description

COA:

Seal:

COMMONWEALTH OF MASSACHUSETTS
MARY ELIZABETH REDDY
MECHANICAL
No. 38123
REGISTERED PROFESSIONAL ENGINEER

Issued For:
BID

Scale: NTS

Key Plan:

NORTH

Date:	MARCH 30, 2022
Drawn By:	DRB
Reviewed By:	MER
Approved By:	MER
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
PLUMBING SCHEDULES

Sheet Number:
P601

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ABBREVIATIONS

Ø	ROUND/DIAMETER	ID	INSIDE DIAMETER
ABV	ABOVE	IEER	INTEGRATED EER
AC	AIR CONDITIONING	IN	INCH
ACCU	AIR COOLED CONDENSING UNIT	IN WC	INCHES WATER COLUMN
ACU	AIR CONDITIONING UNIT	IN WG	INCHES WATER GAUGE
ADD	ADDENDUM	KW	KILOWATT
ADD'L	ADDITIONAL	L	LENGTH
AFF	ABOVE FINISHED FLOOR	LAT	LEAVING AIR TEMPERATURE
AL	ACOUSTIC DUCT LINER	LB	POUND
ALT	ALTERNATE	LB/HR	POUNDS PER HOUR
AMB	AMBIENT	LP	LIQUEFIED PETROLEUM GAS
AMP	AMPERE	LVG	LEAVING
APD	AIR PRESSURE DROP	LVR	LOUVER
ARCH	ARCHITECT/ARCHITECTURAL	MAX	MAXIMUM
ATC	AUTOMATIC TEMPERATURE CONTROL	MBH	ONE THOUSAND BTU PER HOUR
ATM	ATMOSPHERE	MCA	MINIMUM CIRCUIT AMPACITY
AVG	AVERAGE	MCF	ONE THOUSAND CUBIC FEET
BDD	BACKDRAFT DAMPER	MD	MOTORIZED DAMPER
BFC	BELOW FINISHED CEILING	MECH	MECHANICAL
BFF	BELOW FINISHED FLOOR	MEZZ	MEZZANINE
BHP	BRAKE HORSEPOWER	MFR	MANUFACTURER
BI	BACKWARD INCLINED	MIN	MINIMUM
BLDG	BUILDING	MISC	MISCELLANEOUS
BOD	BOTTOM OF DUCT	MOCP	MAXIMUM OVER CURRENT PROTECTION
BOP	BOTTOM OF PIPE	MTR	MOTOR
BOS	BOTTOM OF STEEL	N/A	NOT APPLICABLE
BSMT	BASEMENT	NC	NOISE CRITERIA
BTU	BRITISH THERMAL UNITS	NC	NORMALLY CLOSED
BTUH	BRITISH THERMAL UNITS PER HOUR	NIC	NOT IN CONTRACT
CA	COMBUSTION AIR	NG	NATURAL GAS
CAP	CAPACITY	NO	NUMBER
CAV	CONSTANT AIR VOLUME	NO	NORMALLY OPEN
CC	COOLING COIL	NTS	NOT TO SCALE
CD	CONDENSATE DRAIN	O/A	OUTSIDE AIR
CENT	CENTRIFUGAL	OAI	OUTDOOR AIR INTAKE
CF	CUBIC FEET	OBD	OPPOSED BLADE DAMPER
CFM	CUBIC FEET PER MINUTE	OC	ON CENTER
CL	CENTERLINE	OCC	OCCUPIED
CLG	CEILING	OD	OUTSIDE DIAMETER
CLG	COOLING	ODP	OPEN DRIP PROOF
CO	CLEAN OUT	OED	OPEN END DUCT
CP	CONDENSATE PUMP	OV	OUTLET VELOCITY
CU	CONDENSING UNIT	PD	PRESSURE DROP
D	DRAIN	PH	PHASE
D	DEPTH	POS	PROVIDED BY OTHER SECTION
DB	DRY BULB	PRESS	PRESSURE
DDC	DIRECT DIGITAL CONTROLS	PSI	POUNDS PER SQUARE INCH
DEG	DEGREE	QTY	QUANTITY
DH	DEHUMIDIFICATION UNIT	R	RADIUS
DIA	DIAMETER	R/A	RETURN AIR
DIM	DIMENSION	RET	RETURN
DN	DOWN	RH	RELATIVE HUMIDITY
DOV	DRAIN OFF VALVE	RHC	REHEAT COIL
DP	DIFFERENTIAL PRESSURE	RL	REFRIGERANT LIQUID
DX	DIRECT EXPANSION	RLA	RUNNING LOAD AMPS
EA	EACH	RM	ROOM
E/A	EXHAUST AIR	RPM	REVOLUTIONS PER MINUTE
EAT	ENTERING AIR TEMPERATURE	RS	REFRIGERANT SUCTION
ECM	ELECTRONICALLY COMMUTATED MOTOR	S/A	SUPPLY AIR
EER	ENERGY EFFICIENCY RATIO	SENS	SENSIBLE
EF	EXHAUST FAN	SF	SQUARE FOOT
EFF	EFFICIENCY	SF	SUPPLY FAN
ELEC	ELECTRICAL	SHC	SENSIBLE HEAT CAPACITY
ELEV	ELEVATION	SHR	SENSIBLE HEAT RATIO
EQUIP	EQUIPMENT	SP	STATIC PRESSURE
ESP	EXTERNAL STATIC PRESSURE	SPECS	SPECIFICATIONS
EUH	ELECTRIC UNIT HEATER	SS	STAINLESS STEEL
EXH	EXHAUST	SUP	SUPPLY
EXP	EXPANSION	T	THERMOSTAT
EXT	EXTERNAL	TEFC	TOTALLY ENCLOSED FAN COOLED
F	DEGREES FAHRENHEIT	TEMP	TEMPERATURE
FA	FREE AREA	TOT	TOTAL
FC	FLEXIBLE CONNECTION	TR	TRANSFER
FD	FIRE DAMPER	TSP	TOTAL STATIC PRESSURE
FL	FLOOR	TYP	TYPICAL
FLA	FULL LOAD AMPS	UH	UNIT HEATER
FPM	FEET PER MINUTE	UNO	UNLESS NOTED OTHERWISE
FPS	FEET PER SECOND	UNOCC	UNOCCUPIED
FT	FOOT/FEET	V	VOLTS
G	GAS	VAR	VARIABLE
GA	GAUGE	VEL	VELOCITY
GC	GENERAL CONTRACTOR	VENT	VENTILATION
GPH	GALLONS PER HOUR	VFD	VARIABLE FREQUENCY DRIVE
GPM	GALLONS PER MINUTE	W	WATT
GUH	GAS-FIRED UNIT HEATER	W	WIDTH
H	HUMIDIFIER	W/	WITH
HD	HEAD	W/O	WITHOUT
HGB	HOT GAS BYPASS	WB	WET BULB
HP	HORSE POWER	WC	WATER COLUMN
HR	HOUR	WG	WATER GAUGE
HT	HEIGHT	WMS	WIRE MESH SCREEN
HTG	HEATING	ΔP	CHANGE IN PRESSURE
HTR	HEATER	ΔT	CHANGE IN TEMPERATURE
HX	HEAT EXCHANGER	°F	DEGREES FAHRENHEIT
HZ	HERTZ		

NOTE: SOME OR ALL SYMBOLS MAY BE USED ON THIS PROJECT

HVAC GENERAL NOTES

1. MECHANICAL GENERAL NOTES APPLY TO ALL MECHANICAL DRAWINGS. THE WORD "CONTRACTOR" USED IN "HVAC" OR "MECHANICAL" WORK SHALL MEAN THE HVAC FILED SUB-BIDDER OR MECHANICAL CONTRACTOR.
2. FINAL PRODUCT SHALL BE A COMPLETE AND FUNCTIONING SYSTEM INCLUDING ALL INCIDENTAL ACCESSORIES NECESSARY TO MAKE THE HVAC WORK COMPLETE AND READY FOR OPERATION. FINAL PRODUCT SHALL CONFORM TO ALL REQUIREMENTS OF APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING BUT NOT LIMITED TO THE INTERNATIONAL BUILDING CODE AND INTERNATIONAL MECHANICAL CODE.
3. LOCATIONS OF PIPING, DUCTWORK AND EQUIPMENT AS INDICATED ON THE DRAWING, ARE APPROXIMATE AND SUBJECT TO MINOR ADJUSTMENTS IN THE FIELD. WORK SHALL BE COORDINATED WITH ALL OTHER TRADES TO AVOID INTERFERENCE IN THE FIELD.
4. ALL WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED, INCLUDING BUT NOT LIMITED TO DIV 21, 22, AND 26. OFFSETS IN PIPING AND DUCTS (INCLUDING DIVIDED DUCTS) AND TRANSITIONS AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
5. VERIFY ALL EQUIPMENT CONNECTIONS WITH MANUFACTURER'S CERTIFIED DRAWINGS. VERIFY AND PROVIDE DUCT AND/OR PIPE TRANSITIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DIMENSIONS BEFORE FABRICATION.
6. THE CONTRACTOR SHALL TEST AND CALIBRATE ALL CONTROLS AND VERIFY ALL ARE FULLY FUNCTIONAL AND SUBMIT DOCUMENTATION. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
7. THE CONTRACTOR SHALL PROVIDE AND SUBMIT DOCUMENTATION FOR TESTING AND BALANCING OF ALL AIR SYSTEMS, OPERATING AND MAINTENANCE MANUALS, AND AS BUILT DRAWINGS. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
8. THE CONTRACTOR SHALL COORDINATE ALL FRESH AIR INTAKE, FLUE TERMINATION, AND EXHAUST TERMINATION LOCATIONS WITH ALL OTHER TRADES BASED ON CLEARANCE REQUIREMENTS INDICATED IN THE 2015 IMC AND ALL OTHER APPLICABLE FEDERAL, STATE, AND LOCAL CODES.
9. REFER TO THE PROJECT SPECIFICATIONS FOR FURTHER REQUIREMENTS.
10. MANY EQUIPMENT SCHEDULES DO NOT LIST QUANTITIES. CONTRACTOR SHALL REFER TO ALL DRAWINGS AND PROVIDE THE REQUIRED QUANTITIES FOR ALL COMPONENTS.
11. IN ACCORDANCE WITH SPECIFICATION FOR DIVISION 23, THE CONTRACTOR SHALL COORDINATE WITH ALL TRADES AND PREPARE COORDINATION DRAWINGS PRIOR TO INSTALLATION. COORDINATION DRAWINGS SHALL BE SUBMITTED TO THE OWNERS REPRESENTATIVE FOR REVIEW PRIOR TO INSTALLATION.
12. MINIMAL CONTROL POWER HAS BEEN IDENTIFIED ON THE ATC DRAWINGS. IF ANY ADDITIONAL POWER IS REQUIRED BASED ON SYSTEMS DESIGN BY THE CONTROLS CONTRACTOR THE ATC/BAS CONTRACTOR SHALL BE RESPONSIBLE TO SUPPLY THAT POWER. COORDINATE ALL POWER REQUIREMENTS WITH DIV 26.

DESIGN CONDITIONS

CODES/STANDARDS

2015 INTERNATIONAL MECHANICAL CODE
MASSACHUSETTS STATE BUILDING CODE, NINTH EDITION
2018 INTERNATIONAL ENERGY CONSERVATION CODE

OUTDOOR AIR TEMPERATURE

ASHRAE - BOSTON
WINTER 7°F DB/ 5°F WB
SUMMER 91°F DB/ 73°F WB

INDOOR CONDITIONS (°F)

SPACE	WINTER	SUMMER
PROCESS AREA	55	85
ELECTRICAL ROOM	55	85
MECHANICAL ROOM	55	85

MINIMUM VENTILATION

SPACE	CFM/PERSON	CFM/SF
OPEN AREA	0	1
MECHANICAL ROOM	0	0.06
ELECTRICAL ROOM	0	0

SCOPE OF WORK
(INCLUDING BUT NOT LIMITED TO)

1. PROVIDE EXHAUST FANS FOR PROCESS AREA AND MECHANICAL ROOM.
2. PROVIDE HEAT PUMP FOR ELECTRICAL ROOM.
3. PROVIDE PROPANE UNIT HEATERS FOR HEATING THE PROCESS AREA AND MECHANICAL ROOM.
4. PROVIDE DEHUMIDIFICATION UNIT IN THE PROCESS AREA.

DUCTWORK/RGD SYMBOLS

- V — MANUAL VOLUME DAMPER
- B — BACKDRAFT DAMPER
- M — MOTORIZED DAMPER - AUTOMATIC W/ ACCESS DOOR
- RETURN OR EXHAUST AIRFLOW
- SUPPLY AIRFLOW

NOTE: SOME OR ALL OF THE SYMBOLS MAY BE USED ON THIS PROJECT

PIPING ABBREVIATIONS

- CD — CONDENSATE DRAIN
- D — DRAIN
- NG — NATURAL GAS
- RD — REFRIGERANT DISCHARGE
- RG — REFRIGERANT GAS
- RHGB — REFRIGERANT HOT GAS BYPASS
- RL — REFRIGERANT LIQUID
- RS — REFRIGERANT SUCTION

NOTE: SOME OR ALL SYMBOLS MAY BE USED ON THIS PROJECT

CALLOUT SYMBOLS

- A / H2.0 — SECTION DESIGNATION
- SECTION SHEET NUMBER
- 1 — REVISION NUMBER
- H — HUMIDISTAT/HUMIDITY SENSOR, WALL MOUNTED
- T — THERMOSTAT, WALL MOUNTED
- VAV-XX — EQUIPMENT TAG (REFER TO SCHEDULES FOR DETAILS)

NOTE: SOME OR ALL SYMBOLS MAY BE USED ON THIS PROJECT

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Issued For:
BID

Scale: NTS

Key Plan:

Date:	March 30, 2022
Drawn By:	AVS
Reviewed By:	SEH
Approved By:	SEH
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
LEGENDS, NOTES, AND ABBREVIATIONS

Sheet Number:
H000

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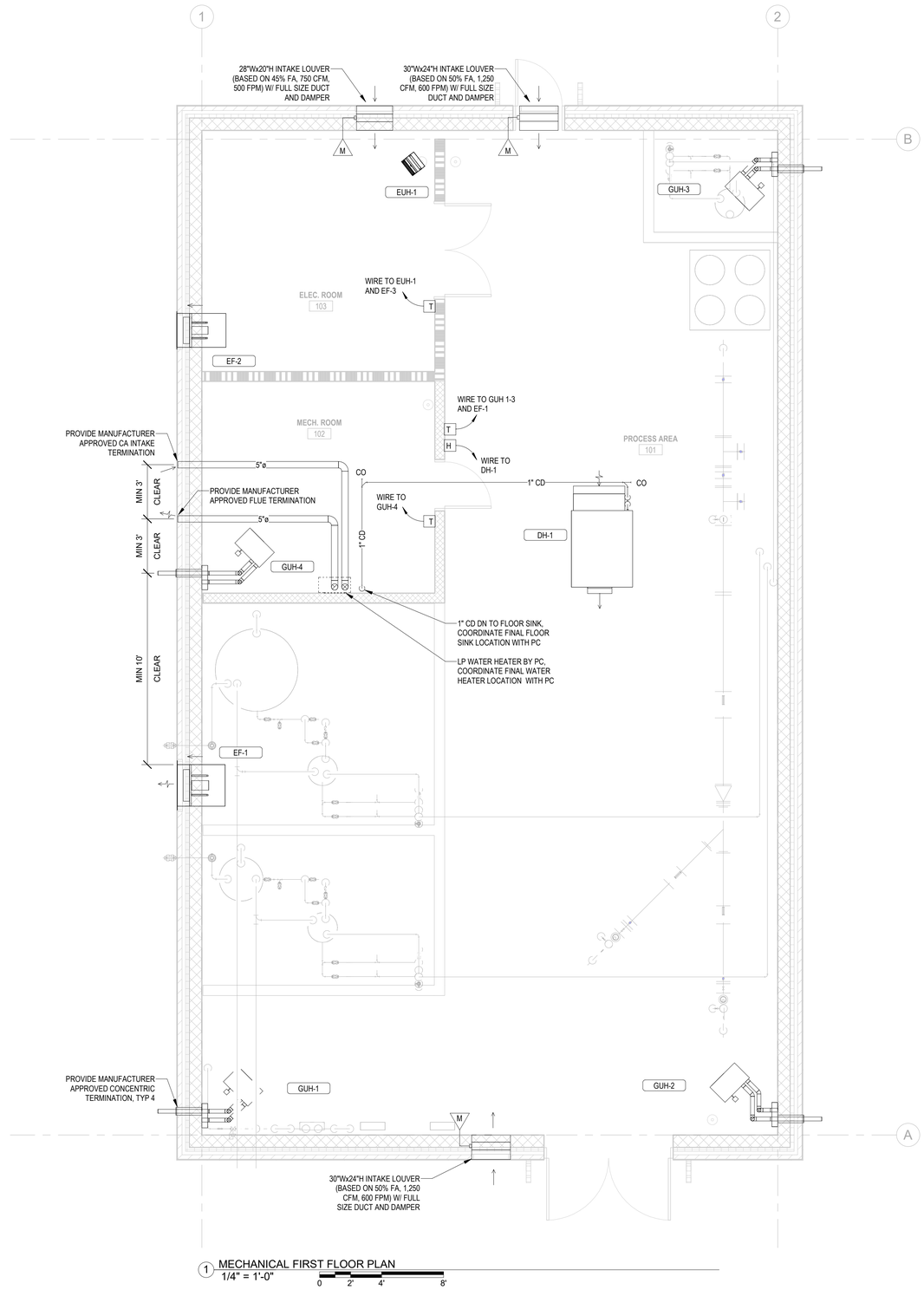

1 MECHANICAL FIRST FLOOR PLAN
1/4" = 1'-0"
0 2' 4' 8'

HVAC NEW WORK NOTES

1. NEW WORK NOTES SHALL APPLY TO ALL HVAC NEW WORK DRAWINGS.
2. 1" FILTER MEDIA SHALL BE TEMPORARILY INSTALLED OVER ALL SUPPLY AIR DIFFUSERS AND REGISTERS PRIOR TO STARTING UP THE NEW AIR HANDLING EQUIPMENT. AFTER THE NEW AIR HANDLING EQUIPMENT HAS RUN FOR A SHORT PERIOD OF TIME, THE MECHANICAL CONTRACTOR SHALL REMOVE THE FILTER MEDIA. THE GENERAL CONTRACTOR SHALL PROVIDE ALL REQUIRED LADDERS AND BATTERY OPERATED LIFTS.
3. BALANCE DIFFUSERS, REGISTERS, GRILLES, AND EQUIPMENT TO FLOWS INDICATED.
4. REFER TO HVAC GENERAL NOTES ON H000 FOR SCOPE OF WORK.
5. CONSTRUCT AND INSTALL ALL DUCTWORK IN ACCORDANCE WITH THE LATEST EDITION OF SMACNA STANDARDS.
6. LOCATE DUCTWORK, PIPING AND MECHANICAL EQUIPMENT OUTSIDE OF THE REQUIRED ELECTRICAL CLEARANCES ABOVE/AROUND ELECTRICAL PANELS. TRANSFORMERS, AND OTHER ELECTRICAL EQUIPMENT.
7. FIRE SEAL AROUND DUCT AND PIPING PENETRATIONS OF FIRE RATED WALLS. PROVIDE FIRE DAMPERS AND ACCESS PANELS AT ALL FIRE RATED ASSEMBLIES AND FLOOR PENETRATIONS. REFER TO ARCHITECTURAL DRAWINGS FOR ASSEMBLY LOCATIONS. REFER TO SPECIFICATIONS.
8. PROVIDE SLEEVES AND/OR OPENINGS TO RUN PIPES AND DUCTS THROUGH FOUNDATIONS, FLOORS, WALLS, AND ROOF.
9. ADJUST PIPING SIZES TO PROPERLY CONNECT TO MECHANICAL EQUIPMENT. PROVIDE SHUTOFF VALVES IN THE PIPING TO ALL EQUIPMENT TO ALLOW FOR SERVICING. UNIONS OR FLANGES SHALL BE ARRANGED SUCH THAT EQUIPMENT CAN BE SERVICED WITHOUT CUTTING AND MINIMAL DISRUPTION OF PIPING SERVING THE EQUIPMENT.
10. MINIMUM SIZE OF CONDENSATE DRAIN PIPING SHALL BE 3/4" UNLESS OTHERWISE NOTED.
11. FOR DETAILS, EQUIPMENT CONNECTIONS, AND PIPE SIZES NOT SHOWN ON THE SEGMENTS, REFER TO DETAILS, SCHEDULES, AND SPECIFICATIONS.
12. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH THE RESPECTIVE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS, AT A LEVEL OF QUALITY AND WORKMANSHIP CONSISTENT WITH THE SPECIFICATIONS.
13. ADJUST DUCTWORK SIZES TO PROPERLY CONNECT TO MECHANICAL EQUIPMENT. PROVIDE MANUAL VOLUME DAMPERS AT POINTS ON ALL DUCTED SYSTEMS WHERE BRANCHES EXTEND FROM LARGER DUCTS.
14. PROVIDE LOW-VOLTAGE WIRING FROM ELECTRICAL SOURCE TO MISCELLANEOUS ATC DEVICES. REFER TO AND COORDINATE WITH DIVISION 26.
15. HVAC CONTRACTOR SHALL INSTALL ALL GAS FIRED FLUE VENTING UNDER THE SUPERVISION OF A LICENSED (MASTER OR JOURNEYMAN) PLUMBER OR GAS FITTER AS IDENTIFIED IN THE MASSACHUSETTS STATE PLUMBING CODE. THE SUPERVISING LICENSED (MASTER OR JOURNEYMAN) PLUMBER OR GAS FITTER SHALL BE RESPONSIBLE FOR SECURING THE GAS FITTING PERMIT IN COMPLIANCE WITH 248 CMR 3.00.

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Drawing Title:
FIRST FLOOR NEW WORK DUCT PLAN

Sheet Number:
H101

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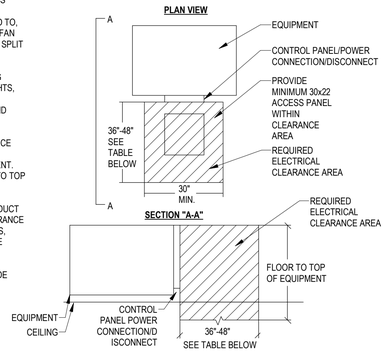
NOTES:
1. DETAIL APPLIES TO ALL MECHANICAL EQUIPMENT LOCATED ABOVE A CEILING THAT REQUIRES POWER, INCLUDING CONTROL POWER. EQUIPMENT INCLUDES, BUT IS NOT LIMITED TO, FAN POWERED BOXES, VAV BOXES, FANS, FAN COIL UNITS, HEAT PUMPS, CRAC UNITS, DX SPLIT SYSTEMS, DUCT HEATERS, ETC.
2. ELECTRICAL CLEARANCE AREA (INCLUDING WITHIN CEILING) MUST BE FREE FROM LIGHTS, SPRINKLER HEADS, FIRE ALARM DEVICES, SPEAKERS, PIPING, DUCTWORK, BEAMS AND OTHER OBSTRUCTIONS.
3. THE HEIGHT OF THE ELECTRICAL CLEARANCE SHALL BE AS REQUIRED TO INSTALL AND PERFORM MAINTENANCE ON THE EQUIPMENT. MINIMUM HEIGHT SHALL BE FROM FLOOR TO TOP OF EQUIPMENT.
4. REFER TO SPECIFIC MANUFACTURER PRODUCT DATA FOR ADDITIONAL ACCESS AND CLEARANCE REQUIREMENTS FOR FANS, COMPRESSORS, VALVES, DAMPERS, FILTERS, ETC. PROVIDE ACCESS PANELS AS REQUIRED.
5. COORDINATE WITH ALL TRADES TO PROVIDE THESE MINIMUM REQUIRED CLEARANCES

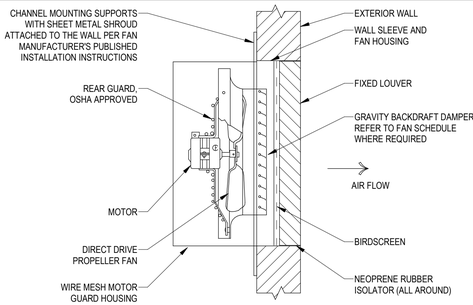


MINIMUM ELECTRICAL CLEARANCES (NEC 2017 COMPLIANCE)			
VOLTAGE TO GROUND (SINGLE PHASE VOLTAGE)	CONDITION 1	CONDITION 2	CONDITION 3
0-150	36"	36"	36"
151-600	36"	42"	48"

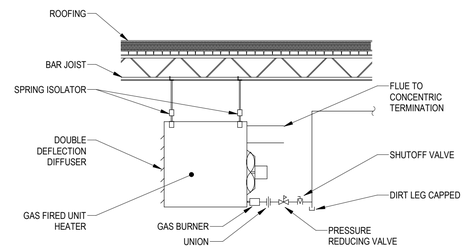
CONDITION 1 - EXPOSED LIVE PARTS ON ONE SIDE OF THE WORKING SPACE AND NO LIVE OR GROUNDED PARTS ON THE OTHER SIDE OF THE WORKING SPACE, OR EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORKING SPACE THAT ARE EFFECTIVELY GUARDED BY INSULATING MATERIALS.
CONDITION 2 - EXPOSED LIVE PARTS ON ONE SIDE OF THE WORKING SPACE AND GROUNDED PARTS ON THE OTHER SIDE OF THE WORKING SPACE. CONCRETE BRICK, OR TILE WALLS SHALL BE CONSIDERED AS GROUNDED CONDITION 3 - EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORKING SPACE

NOTE: CLEARANCE WIDTH SHALL BE 30" OR THE WIDTH OF THE CONTROL PANEL/POWER CONNECTION, WHICHEVER IS GREATER

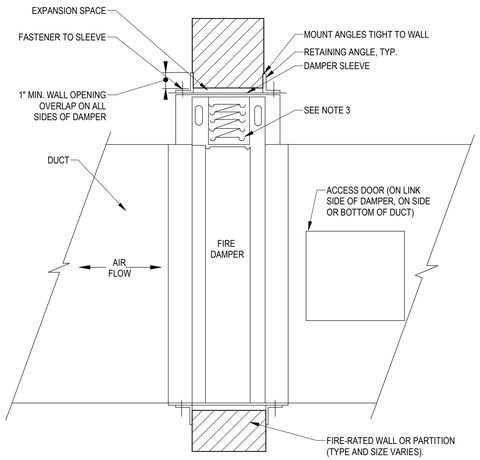
1 H501 ELECTRICAL CLEARANCE ATC CEILING
NOT TO SCALE


CHANNEL MOUNTING SUPPORTS WITH SHEET METAL SHROUD ATTACHED TO THE WALL PER FAN MANUFACTURER'S PUBLISHED INSTALLATION INSTRUCTIONS
REAR GUARD, OSHA APPROVED
MOTOR
DIRECT DRIVE PROPELLER FAN
WIRE MESH MOTOR GUARD HOUSING
EXTERIOR WALL
WALL SLEEVE AND FAN HOUSING
FIXED LOUVER
GRAVITY BACKDRAFT DAMPER, REFER TO FAN SCHEDULE WHERE REQUIRED
AIR FLOW
BIRDSCREEN
NEOPRENE RUBBER ISOLATOR (ALL AROUND)

3 H501 WALL MOUNTED PROPELLER FAN
NOT TO SCALE

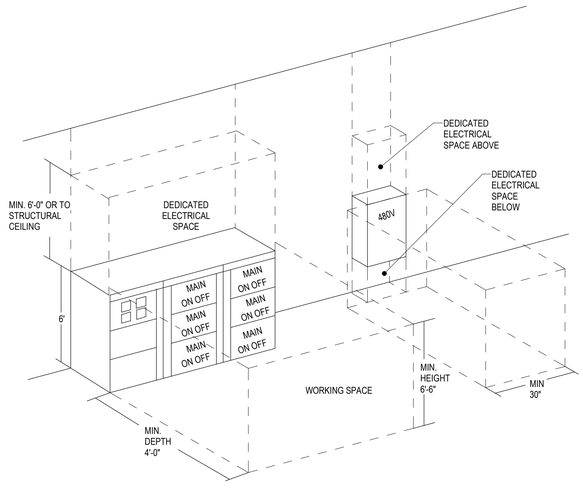


4 H501 GAS UH INSTALLATION
NOT TO SCALE


EXPANSION SPACE
FASTENER TO SLEEVE
1" MIN. WALL OPENING OVERLAP ON ALL SIDES OF DAMPER
DUCT
AIR FLOW
MOUNT ANGLES TIGHT TO WALL
RETAINING ANGLE, TYP.
DAMPER SLEEVE
SEE NOTE 3
ACCESS DOOR (ON LINK SIDE OF DAMPER, ON SIDE OR BOTTOM OF DUCT)
FIRE DAMPER
FIRE-RATED WALL OR PARTITION (TYPE AND SIZE VARIES).

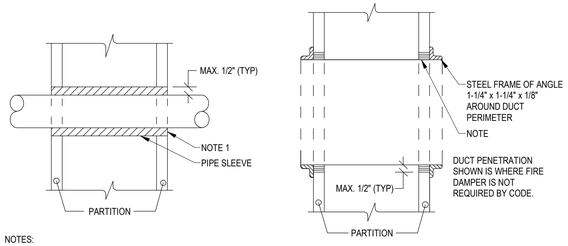
NOTES:
1. WALL OPENING SHALL BE SIZED TO MAINTAIN MANUFACTURER'S REQUIRED EXPANSION SPACE AROUND DAMPER.
2. DAMPER BLADES SHALL BE OUT OF AIRSTREAM TYPE "3A,3B,7 OR 8" (SEE SMACNA FIRE DAMPER AND HEAT STOP GUIDE - 2ND EDITION PAGE 9 OR NEWER VERSION IF APPLICABLE) WHEN OPEN 100% FREE AREA IS REQUIRED. WHEN DUCT DIMENSIONS ARE LARGER THEN THE LARGEST AVAILABLE CURTAIN TYPE DAMPER (SHOWN), PROVIDE BLADE TYPE DAMPERS (SIMILAR TO FIRE/SMOKE DAMPERS). IF POWERED ACTIVATORS ARE REQUIRED, THE WIRING SHALL BE INCLUDED IN THE MECHANICAL CONTRACTOR'S COST.
3. PROVIDE SPRING LOADED CLOSURE FOR ALL FIRE DAMPERS.
4. WHEN DUCTWORK IS INSULATED OR LINED, PROVIDE INSULATED ACCESS DOOR.
5. ACCESS DOOR SHALL BE 12"x12" OR LARGER IF REQUIRED FOR FUSIBLE LINK REPLACEMENT.
6. TYPE "1" OR "2" FIRE DAMPERS (BLADES OR FROM IN AIR STREAM) MAY BE SUBSTITUTED FOR TYPE "3A OR 3B" WHERE VELOCITIES ARE UNDER 500 FPM IN LOW PRESSURE DUCT SYSTEMS ONLY.
7. INSTALLATION SHOWN AS AN EXAMPLE. SPECIFIC INSTALLATION REQUIREMENTS, INCLUDING BREAKAWAY CONNECTIONS, SHALL CONFORM WITH MANUFACTURER'S UL APPROVED INSTRUCTIONS.
8. NEW FIRE DAMPERS INSTALLATION IN EXISTING CONCRETE FLOORS SHALL BE RATED FOR "OUT OF FLOOR" APPLICATIONS WITH MINIMUM 18 GAUGE SLEEVE EXTENSION WITH INSULATION PROVIDED BY THE FIRE DAMPER MANUFACTURER.

7 H501 FIRE DAMPER
NOT TO SCALE



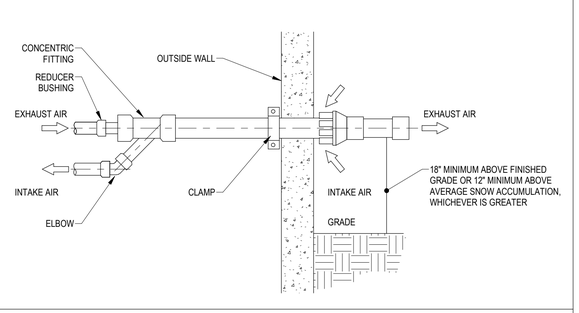
NOTES:
1. NO EQUIPMENT FOREIGN TO THE ELECTRICAL INSTALLATION (PIPING, DUCTS, ETC) SHALL ENTER THE DEDICATED SPACE ABOVE OR BELOW ELECTRICAL POWER EQUIPMENT INCLUDING BUT NOT LIMITED TO SWITCHGEAR, SWITCHBOARDS, PANELBOARDS, AND MOTOR CONTROL CENTERS.
2. NO EQUIPMENT SHALL PROTRUDE INTO WORKING SPACE.
3. PIPING AND DUCTWORK SYSTEMS INSTALLED ABOVE THE DEDICATED ELECTRICAL SPACE SHALL BE ALLOWED WHERE DRIP PANS ARE INSTALLED TO CAPTURE LEAKS, RUPTURES OR CONDENSATION DRIPS. THE PIPING AND DRIP PANS SHALL BOTH BE OUTSIDE THE DEDICATED SPACE ENVELOPE. THE DRAIN PIPE FROM THE DRIP PANS SHALL BE PIPED TO A DRAIN OUTSIDE THE ELECTRICAL ROOM.
4. PIPING AND DUCTWORK SYSTEMS SHALL NOT BE INSTALLED IN THE ELECTRIC ROOM UNLESS ABSOLUTELY NECESSARY.
5. CONFIRM ALL DIMENSIONS SHOWN WITH DIV 26 PRIOR TO ANY PIPE OR DUCT INSTALLATION.

2 H501 ELECTRICAL WORK AND DEDICATED SPACE
NOT TO SCALE

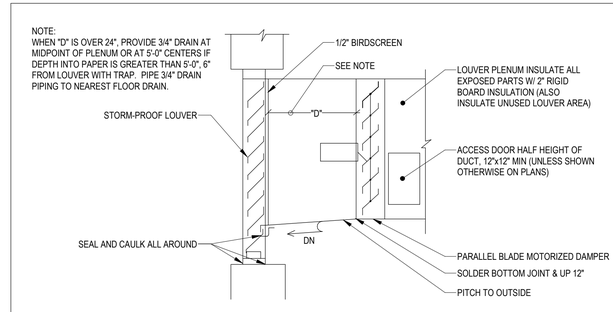

MAX. 1/2" (TYP)
NOTE 1
PIPE SLEEVE
PARTITION
STEEL FRAME OF ANGLE 1-1/4" x 1-1/4" x 1/8" AROUND DUCT PERIMETER
NOTE
DUCT PENETRATION SHOWN IS WHERE FIRE DAMPER IS NOT REQUIRED BY CODE.
MAX. 1/2" (TYP)
PARTITION

NOTES:
1. AT FIRE RATED PARTITIONS ADD ADDITIONAL LAYER OF FIRE SAFIN INSULATION AROUND PENETRATIONS SO AS TO FILL CAVITY.
2. DUCT AND PIPE PENETRATIONS THROUGH CORRIDOR WALLS ABOVE THE CEILING ARE TO BE FIRE STOPPED AROUND THE PENETRATION.

5 H501 DUCT & PIPE WALL PENETRATIONS
NOT TO SCALE



6 H501 CONCENTRIC TERMINATION THRU ROOF
NOT TO SCALE


NOTE:
WHEN "D" IS OVER 24", PROVIDE 3/4" DRAIN AT MIDPOINT OF PLENUM OR AT 5'-0" CENTERS IF DEPTH INTO PAPER IS GREATER THAN 5'-0", 6" FROM LOUVER WITH TRAP. PIPE 3/4" DRAIN PIPING TO NEAREST FLOOR DRAIN.
STORM-PROOF LOUVER
SEAL AND CAULK ALL AROUND
1/2" BIRDSCREEN
SEE NOTE
"D"
DN
LOUVER PLENUM INSULATE ALL EXPOSED PARTS W/ 2" RIGID BOARD INSULATION (ALSO INSULATE UNUSED LOUVER AREA)
ACCESS DOOR HALF HEIGHT OF DUCT, 12"x12" MIN (UNLESS SHOWN OTHERWISE ON PLANS)
PARALLEL BLADE MOTORIZED DAMPER
SOLDER BOTTOM JOINT & UP 12"
PITCH TO OUTSIDE

8 H501 LOUVER CONNECTION
NOT TO SCALE

Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD CHATHAM, MA 02633

WELL 10 AND 11 PUMPING AND TREATMENT DESIGN
MILL HILL ROAD CHATHAM, MA 02633

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Consultants:

Revisions:

No.	Date	Description

COA:

Seal:
COMMONWEALTH OF MASSACHUSETTS
SCOTT E. HENDRICKS
MECHANICAL
NO. 40721
REGISTERED PROFESSIONAL ENGINEER

Issued For:
BID

Scale: NTS

Key Plan:

Date:	March 30, 2022
Drawn By:	AVS
Reviewed By:	SEH
Approved By:	SEH
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
DETAILS

Sheet Number:
H501

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EXHAUST FAN SCHEDULE

ID	MANUFACTURER	MODEL NO.	TYPE	FAN								SOUND PRESS LEVEL (dBA)	WEIGHT (lb)	ELECTRICAL DATA			REMARKS
				AIRFLOW	VELOCITY	PRESS		WHEEL	DRIVE	MOTOR							
				DESIGN	OUTLET	ESP	RPM	DIA	TYPE	BHP	HP	ECM			FLA	V	PH	
EF-1	GREENHECK	AER-E24C-610-VG	WALL MOUNTED	2500	771	0.50	1183	24 1/8"	DIRECT	0.37	0.75	Yes	76	235	8.8	115	1	1 THRU 4, 6
EF-2	GREENHECK	AER-E20C-610-VG	WALL MOUNTED	750	331	0.50	1146	20 1/8"	DIRECT	0.15	0.50	Yes	58	180	6.4	115	1	1 THRU 5

NOTES:
1. REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION.
2. PROVIDE WITH BIRD SCREEN. PROVIDE SHORT WALL HOUSING FLUSH TO INTERIOR (LOUVER INSTALLATION) WITH OSHA GUARD.
3. PROVIDE ULTRA LOW LEAKAGE MOTORIZED DAMPER WITH LOW VOLTAGE DAMPER ACTUATOR.
4. PROVIDE WITH SINGLE POINT POWER AND FACTORY TOGGLE TYPE DISCONNECT SWITCH.
5. PROVIDE WITH ECM TYPE MOTOR WITH MOTOR MOUNTED SPEED CONTROL DIAL.
6. PROVIDE WITH ECM TYPE MOTOR WITH MOUNTED 2-SPEED CONTROL AND INTEGRAL TRANSFORMER. LOW SPEED SHALL BE SET TO 750 CFM.

GAS-FIRED UNIT HEATER SCHEDULE

ID	LOCATION		MANUFACTURER	MODEL NO.	TYPE	ARRANGEMENT	MOTOR		GAS BURNER					AIRSIDE			WEIGHT (lb)	ELECTRICAL DATA			REMARKS
												FUEL	PRESS (IN WC)								
	NAME	NO.					HP	RPM	INPUT (MBH)	OUTPUT (MBH)	EFF (%)	TYPE	MIN	MAX	CFM	EAT DB (°F)	LAT DB (°F)		FLA	V	PH	
GUH-1	OPEN AREA	101	Modine	HDS 45AS01	PROPELLER	HORIZONTAL	0.1	1550	45.0	36.9	82	LP	11.0	14.0	720	55.0	101.0	60	3.75	120	1	1 THRU 6
GUH-2	OPEN AREA	101	Modine	HDS 45AS01	PROPELLER	HORIZONTAL	0.1	1550	45.0	36.9	82	LP	11.0	14.0	720	55.0	101.0	60	3.75	120	1	1 THRU 6
GUH-3	OPEN AREA	101	Modine	HDS 45AS01	PROPELLER	HORIZONTAL	0.1	1550	45.0	36.9	82	LP	11.0	14.0	720	55.0	101.0	60	3.75	120	1	1 THRU 6
GUH-4	MECH RM	102	MODINE	HDS 30AS01	PROPELLER	HORIZONTAL	0.1	1550	30.0	24.6	82	LP	11.0	14.0	505	55.0	99.0	55	3.75	120	1	1 THRU 6

NOTES:
1. REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION.
2. PROVIDE 20 GAUGE CABINET WITH BAKED ENAMEL FINISH AND OSHA FAN GUARD. PROVIDE WITH TWO-STAGE GAS VALVE AND TWO STAGE THERMOSTAT.
3. PROVIDE BURNER WITH 409 STAINLESS STEEL HEAT EXCHANGER AND 321 STAINLESS STEEL BURNER BOX. PROVIDE BURNER CONTROLS WITH DIRECT SPARK IGNITION, HIGH LIMIT SWITCH, AND AIR PRESSURE SWITCH. PROVIDE WITH FACTORY SEALED COMBUSTION, CONCENTRIC TERMINATION, AND VENT CAP. PROVIDE WITH NATURAL GAS TO PROPANE CONVERSION KIT.
4. DISCONNECT SHALL BE PROVIDED BY DIV 26.
5. PROVIDE WITH FACTORY MOUNTING BRACKETS AND VIBRATION ISOLATION.
6. PROVIDE WITH 10 YEAR HEAT EXCHANGER WARRANTY AND A 1 YEAR PARTS AND LABOR WARRANTY.

ELECTRIC UNIT HEATER SCHEDULE

ID	LOCATION		MANUFACTURER	MODEL NO.	TYPE	FAN					HEATING COIL		HEATING ELEMENT		WEIGHT (lb)	ELECTRICAL DATA				REMARKS
						AIRFLOW		MOTOR			AIRSIDE									
	NAME	NO				DESIGN (CFM)	DRIVE TYPE	QTY	POWER (W)	RPM	EAT DB (°F)	LAT DB (°F)	QTY	POWER (KW)		FLA	MCA	V	PH	
EUH-1	ELEC RM	103	QMARK	MWUH5004	HORIZONTAL	270	DIRECT	1	0.01	1350	50.0	72.0	1	1.8	24	9.0	11.3	208	1	1 THRU 6

NOTES:
1. REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION.
2. PROVIDE HEAVY GAUGE STEEL HOUSING WITH BAKED ENAMEL FINISH. PROVIDE WITH FACTORY MOUNTING KIT.
3. PROVIDE TOTALLY ENCLOSED FAN MOTOR.
4. PROVIDE HEATING ELEMENT WITH 5 YEAR WARRANTY AND NON GLOWING DESIGN.
5. PROVIDE UNIT WITH THERMAL CUTOUT WITH AUTOMATIC RESET.
6. PROVIDE WITH SINGLE POINT POWER AND FACTORY DISCONNECT SWITCH.

DEHUMIDIFER SCHEDULE

ID	LOCATION		MANUFACTURER	MODEL NO.	TYPE	FAN DATA				COOLING DATA						COMPRESSOR DATA		DEHUMIDIFCATION DATA				WEIGHT (lb)	ELECTRICAL DATA					REMARKS
	NAME	NO.				CFM	ESP (IN WC)	TSP (IN WC)	HP	NOMINAL CAP (TONS)	TOTAL (MBH)	SENSIBLE (MBH)	EAT (DB)	EAT (WB)	TOTAL HEAT OF REJECTION (MBH)	MOTOR (QTY)	TYPE	DEW PT (°F)	RH (%)	WATER REMOVAL (lb/hr)	REFRIGERANT TYPE		FLA	MCA	MOCP	V	PH	
DH-1	OPEN AREA	101	DESERTAIRE	LW08	HORIZONTAL	4300	0.50	1.36	3.0	6.5	77.9	65.5	65.0	54.3	99.0	1	SCROLL	46.0	50	11.8	R407C	1300	15	23	35	460	3	1 THRU 7

NOTES:
1. REFER TO SPECIFICATIONS, DETAILS, AND CONTROL DIAGRAMS FOR ADDITIONAL INFORMATION.
2. PROVIDE CABINET WITH 18 GAUGE GALVANNEALED STEEL INSULATED PANELS, INSULATION SHALL BE CLOSED CELL FOAM. SIDE PANELS SHALL BE REMOVABLE FOR SERVICE. PROVIDE UNIT WITH POWDER COATED FINISH.
3. PROVIDE HIGH EFFICIENCY BLOW MOTORS. PROVIDE WITH BACNET CONNECTIVITY.
4. PROVIDE STAINLESS STEEL DRAIN PAN.
5. PROVIDE WITH 4" MERV 8 FILTERS.
6. PROVIDE WITH 2 YEAR COMPLETE UNIT WARRANTY (PARTS AND LABOR) AND 5 YEAR COMPRESSOR WARRANTY.
7. PROVIDE FACTORY DISCONNECT SWITCH.

PIPE INSULATION (2015 IECC AND ASHRAE 90.1 2013 COMPLIANCE)

MINIMUM INSULATION THICKNESS IN INCHES FOR INDOOR PIPE SIZES (SEE NOTES BELOW)

PIPING SYSTEM TYPES	FLUID TEMPERATURE RANGE (°F)	<1"	1" & 1-1/4"	1-1/2" - 3"	4" - 6"	8" AND UP	K-FACTOR (BTU-INCH/°F-HR-SF) AT AVG TEMPERATURE (°F)
REFRIGERANT OR COOLING COIL CONDENSATE DRAIN	<60	0.5	1	1	1	1	0.20-0.27 @ 75°F

NOTES:
1. REFER TO SPECIFICATIONS AND DETAILS FOR ADDITIONAL INFORMATION.
2. FOR MINIMUM THICKNESS OF ALTERNATIVE INSULATION TYPES OUTSIDE THE STATED CONDUCTIVITY RANGE, SEE TEST METHOD FOR STEADY STATE HEAT TRANSFER PROPERTIES OF HORIZONTAL PIPE INSULATIONS, ASTM C 335-95, AND THE STATE ENERGY CODE.
3. ALL OUTDOOR REFRIGERANT PIPING SHALL BE PROVIDED WITH 3/4" THICK INSULATION WITH PVC JACKETING.

MINIMUM DUCT INSULATION R-VALUES

LOCATION	SUPPLY	RETURN	RAW OUTDOOR AIR	EXHAUST	
				W/ ENERGY RECOVERY	W/O ENERGY RECOVERY
ATTIC TYPE SPACE (EXPOSED ROOF AREA)	R-8	R-8	R-4	R-8	R-6*
EXPOSED IN MECHANICAL ROOM	R-5	R-5	R-5	R-5	-0-
EXPOSED IN ZONE SERVED	-0-	-0-	R-4	-0-	-0-

* R-VALUE SHOWN IS ONLY IF AREA OF BUILDING BEING EXHAUSTED IS HUMIDIFIED. IF NOT HUMIDIFIED, NO INSULATION (-0-), UNLESS FIRE WRAP OR LINING IS NEEDED.

NOTES: (SEE SPECIFICATIONS FOR R-VALUES OF VARIOUS DUCT INSULATION AND LINERS)
1 REFER TO SPECIFICATIONS AND DETAILS FOR ADDITIONAL INFORMATION.
2 R-VALUES SHOWN ARE AS INSTALLED. USE R-VALUES FOR 25% COMPRESSION FOR NON-RIGID INSULATION.

DUCTWORK PRESSURE CLASS AND SEAL CLASS

PRESSURE CLASS	STATIC PRESSURE CLASS	SMACNA SEAL CLASS	SMACNA LEAKAGE CLASS		DESIGN VELOCITY LIMITS
			RECTANGULAR	ROUND	
2"	2" POS OR NEG	A	6	3	2000 FPM OR LESS

UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE DRAWINGS, USE THE FOLLOWING PRESSURE CLASSIFICATIONS FOR THE TYPES OF DUCTWORK LISTED...

2" CLASS	ALL DUCTWORK

NOTES
1 REFER TO SPECIFICATIONS AND DETAILS FOR ADDITIONAL INFORMATION.

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Issued For:
BID

Scale: NTS

Key Plan:

Date:	March 30, 2022
Drawn By:	AVS
Reviewed By:	SEH
Approved By:	SEH
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
SCHEDULES

Sheet Number:
H601

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CONTROL POINT DESCRIPTOR LEGEND

TAG (oval)	ATC CONTRACTOR PROVIDED DDC POINT AND HARDWARE
TAG (triangle)	CONTROL DEVICE FURNISHED BY ELECTRICAL OR PLUMBING CONTRACTOR BUT INTERFACED TO DDC SYSTEM BY ATC CONTRACTOR (ELEC SHOWN)
TAG (rectangle)	ATC CONTRACTOR INTERFACE TO EQUIPMENT MANUFACTURER'S HARDWARE
TAG (oval)	ATC CONTRACTOR PROVIDED LOCAL CONTROL POINT

CONTROL ABBREVIATIONS

ACD	AUTOMATIC CONTROL DAMPER	LAT	LEAVING AIR TEMP SENSOR
ALM	ALARM	NC	NORMALLY CLOSED (ON LOSS OF POWER)
ATC	AUTOMATIC TEMPERATURE CONTROL	NO	NORMALLY OPEN (ON LOSS OF POWER)
CAP	CAPACITY CONTROL	OAD	OUTSIDE AIR DAMPER
CT	CURRENT TRANSFORMER (STATUS FEEDBACK)	RAD	RETURN AIR DAMPER
		RH	RELATIVE HUMIDITY
DAT	DISCHARGE AIR TEMPERATURE SENSOR	S	SWITCH
DDC	DIRECT DIGITAL CONTROL	SAD	SUPPLY AIR DAMPER
EAD	EXHAUST AIR DAMPER	SPD	SPEED CONTROL
EAT	ENTERING AIR TEMPERATURE	S/S	START/STOP
ECM	ELECTRONICALLY COMMUTATED MOTOR	T	THERMOSTAT
ES	END SWITCH	TS	TEMPERATURE SENSOR
FA	FAULT ALARM	VFD	VARIABLE FREQUENCY DRIVE
H	RELATIVE HUMIDITY SENSOR	VFDS	VFD SPEED
HE	HIGH EFFICIENCY	VFDO	VFD OUTPUT (FEEDBACK)
HOA	HANDS-OFF AUTOMATIC SWITCH		
HS	HAND SWITCH		

DIAGRAM EQUIPMENT SYMBOLS

FILTER	CENTRIFUGAL FAN
REHEAT COIL	PROPELLER FAN
GAS FURNACE (G / F)	INLINE CENTRIFUGAL FAN
DX COOLING COIL (DX / C)	PARALLEL BLADE DAMPER (TWO POSITION)
UNIT HEATER	PARALLEL BLADE DAMPER (MODULATING)
	OPPOSED BLADE DAMPER (TWO POSITION)
	OPPOSED BLADE DAMPER (MODULATING)

NOTE: SOME OR ALL SYMBOLS MAY BE USED ON THIS PROJECT

GENERAL ATC NOTES

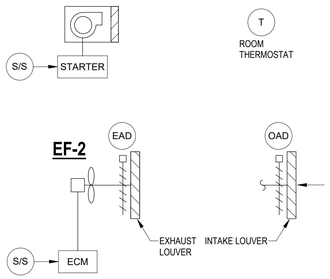
1. REFER TO SPECIFICATIONS FOR ADDITIONAL DETAILS AND REQUIREMENTS.
2. ON-SITE TRAINING SHALL ALSO INCLUDE A MINIMUM OF 8 HOURS OF HANDS ON INSTRUCTION GEARED TOWARD OPERATION AND MAINTENANCE OF THE SYSTEMS, PRIOR TO TRAINING, THE NECESSARY LESSON PLANS, TRAINING DOCUMENTS, HANDOUTS, ETC. SHALL BE PROVIDED WITH THE CURRICULUM OUTLINED.
3. ALL TRAINING SHALL BE RECORDED AND COPIED TO DVD BY THE ATC CONTRACTOR. THREE COPIES OF THE RECORDED SESSIONS SHALL BE SUBMITTED TO THE OWNER FOR THEIR USE.
4. PROVIDE WIRING FROM ELECTRICAL SOURCE TO MISCELLANEOUS ATC DEVICES. REFER TO HVAC PLANS, HVAC MECHANICAL ROOM PLANS, AND ELECTRICAL PLANS FOR LOCATION OF POWER SOURCES FOR ATC SYSTEM.
5. LOCATION OF ALL NEW DDC CONTROL PANELS SHALL BE FIELD VERIFIED WITH THE EXISTING CONDITIONS BY THE CONTRACTOR AND WITH DIV 26.
6. ALL ATC CONTROLS SHALL BE HARDWIRED. NO WIRELESS TECHNOLOGY SHALL BE ALLOWED. ALL EXPOSED WIRING SHALL BE INSTALLED IN MINIMUM 1/2 INCH GALVANIZED EMT CONDUIT.

DDC MATRIX

DDC CONTROL MATRIX		
EQUIPMENT CATEGORY	CONTROLS BY: MFR	ATC
DH-X		X
EXHAUST FANS		X
EUH		X
GUH		X

1. LOCATE ATC PANELS IN MECHANICAL ROOM. COORDINATE LOCATION OF PANELS.
2. EQUIPMENT PROVIDED WITH PACKAGED CONTROL WILL BE PROVIDED WITH BACNET COMMUNICATION ACCESSORIES TO INTEGRATED INTO BMS. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ATC CONTRACTOR AND EQUIPMENT MANUFACTURERS.

EUH-1



ELECTRIC ROOM CONTROLS:
GENERAL
1. ELECTRIC UNIT HEATER, EXHAUST FAN, AND DAMPER SHALL BE STARTED AND STOPPED VIA ELECTRONIC THERMOSTAT.
2. ALL SETPOINTS SHALL BE ADJUSTABLE.
3. ALL TEMPERATURES LISTED ARE IN FAHRENHEIT.
4. PROVIDE NEW ELECTRIC ACTUATORS AND DAMPERS. ALL DAMPERS SHALL BE LOW-VOLTAGE TYPE.
5. MOTOR RATED RELAYS SHALL BE PROVIDED TO INTERFACE MANUAL MOTOR STARTER WITH CONTROL WIRING TO SATISFY CONTROL SEQUENCE.

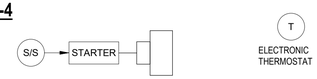
HEATING MODE
1. THE ELECTRIC UNIT HEATER FAN AND EXHAUST FAN SHALL BE DE-ENERGIZED AND THE OUTSIDE AIR DAMPER (OAD) AND EXHAUST DAMPER (EAD) SHALL BE CLOSED.
2. UPON A DROP IN SPACE TEMPERATURE BELOW THE SETPOINT OF 60°F (ADJ), THE HEATER SHALL BE ENERGIZED.
3. THE OPPOSITE SHALL OCCUR ON A RISE IN SPACE TEMPERATURE ABOVE 62°F (ADJ).

COOLING MODE
1. THE ELECTRIC UNIT HEATER FAN AND EXHAUST FAN SHALL BE DE-ENERGIZED AND THE OUTSIDE AIR DAMPER (OAD) AND EXHAUST DAMPER (EAD) SHALL BE CLOSED.
2. UPON A RISE IN SPACE TEMPERATURE ABOVE THE SETPOINT OF 85°F (ADJ), THE OAD AND EAD SHALL OPEN, THEN THE EXHAUST FAN SHALL BE ENERGIZED.
3. THE OPPOSITE SHALL OCCUR ON A DROP IN SPACE TEMPERATURE BELOW 80°F (ADJ).

ELECTRIC ROOM FAN AND HEATER CONTROL SEQUENCE

EF-2

GUH 1-4



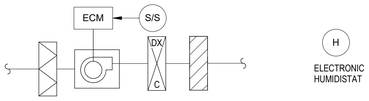
GAS UNIT HEATER CONTROLS:
GENERAL
1. UNIT HEATER SHALL BE STARTED AND STOPPED VIA LOCAL THERMOSTAT.
2. ALL SETPOINTS SHALL BE ADJUSTABLE.
3. MOTOR RATED RELAYS SHALL BE PROVIDED TO INTERFACE MANUAL MOTOR STARTER WITH CONTROL WIRING TO SATISFY CONTROL SEQUENCE.
4. ALL TEMPERATURES LISTED ARE IN FAHRENHEIT.

OCCUPIED UNIT HEATER CONTROL
1. THE UNIT HEATER FAN SHALL BE DE-ENERGIZED. UPON A DROP IN SPACE TEMPERATURE BELOW THE SETPOINT OF 65°F (ADJ), THE GAS HEATER SHALL BE STAGED ON AND AFTER A TIME DELAY (PRESENT BY THE EQUIPMENT MANUFACTURER) THE FAN SHALL ENERGIZE TO MAINTAIN THE SPACE TEMPERATURE SET POINT.
2. THE REVERSE SHALL OCCUR ON A RISE IN SPACE TEMPERATURE ABOVE 70°F (ADJ).

UNOCCUPIED UNIT HEATER CONTROL
1. UPON A DROP IN SPACE TEMPERATURE BELOW THE SETPOINT OF 55°F (ADJ), THE GAS HEATER SHALL BE STAGED ON AND AFTER A TIME DELAY (PRESENT BY THE EQUIPMENT MANUFACTURER) THE FAN SHALL ENERGIZE TO MAINTAIN THE SPACE TEMPERATURE SET POINT.
2. THE REVERSE SHALL OCCUR ON A RISE IN SPACE TEMPERATURE ABOVE 62°F (ADJ).

GAS-FIRED UNIT HEATER CONTROL SEQUENCE

DH-1

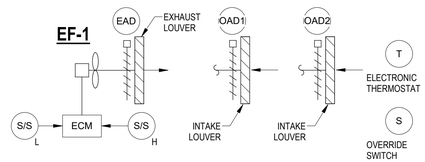


DEHUMIDIFICATION UNIT CONTROLS:
GENERAL
1. DEHUMIDIFICATION UNIT (DH) SHALL BE STARTED AND STOPPED VIA ELECTRONIC HUMIDISTAT.
2. ALL SETPOINTS SHALL BE ADJUSTABLE.
3. MOTOR RATED RELAYS SHALL BE PROVIDED TO INTERFACE MANUAL MOTOR STARTER WITH CONTROL WIRING TO SATISFY CONTROL SEQUENCE.
4. ALL TEMPERATURES LISTED ARE IN FAHRENHEIT.
5. THE DH SHALL NOT OPERATE WHILE THE INTERLOCKED EXHAUST FANS ARE OPERATING.

CONTROL SEQUENCE
1. THE DH SHALL BE DE-ENERGIZED. UPON A RISE IN SPACE HUMIDITY ABOVE THE SETPOINT OF 50%RH (ADJ), THE DH SHALL BE ENERGIZED.
2. THE OPPOSITE SHALL OCCUR ON A DROP IN SPACE HUMIDITY BELOW 45%RH (ADJ).

DEHUMIDIFICATION UNIT CONTROL SEQUENCE

EF-1



EXHAUST FAN CONTROLS:
GENERAL
1. EXHAUST FAN SHALL BE STARTED AND STOPPED VIA ELECTRONIC THERMOSTAT.
2. ALL SETPOINTS SHALL BE ADJUSTABLE.
3. MOTOR RATED RELAYS SHALL BE PROVIDED TO INTERFACE MANUAL MOTOR STARTER WITH CONTROL WIRING TO SATISFY CONTROL SEQUENCE.
4. ALL DAMPERS SHALL BE LOW-VOLTAGE TYPE.
5. ALL TEMPERATURES LISTED ARE IN FAHRENHEIT.
6. INTERLOCK WITH DEHUMIDIFICATION UNIT (DH-1). WHENEVER THE EXHAUST FAN IS ON OR IN PURGE THE DEHUMIDIFICATION UNIT SHALL BE OFF.

CONTROL SEQUENCE
1. THE EXHAUST FAN SHALL BE DE-ENERGIZED. UPON A RISE IN SPACE TEMPERATURE ABOVE THE SETPOINT OF 85°F (ADJ), THE OAD1, OAD2, AND EAD SHALL OPEN, THEN THE EXHAUST FAN SHALL BE ENERGIZED (HIGH SPEED).
2. THE OPPOSITE SHALL OCCUR ON A DROP IN SPACE TEMPERATURE BELOW 80°F (ADJ).

OVERRIDE SEQUENCE
1. OVERRIDE SHALL BE CONTROLLED BY LOCAL ON/AUTO/PURGE SWITCH.
2. WHEN EXHAUST FAN IS SWITCHED TO ON, EAD AND OAD1 SHALL OPEN, EXHAUST FAN SHALL ENERGIZE AT LOW SPEED.
3. WHEN EXHAUST FAN IS SWITCH TO PURGE, EAD, OAD1, AND OAD2 SHALL OPEN, EXHAUST FAN SHALL ENERGIZE AT HIGH SPEED.
4. WHEN THE EXHAUST FAN IS SWITCH TO AUTO THE SEQUENCE SHALL RETURN TO THE NORMAL CONTROL SEQUENCE.

EXHAUST FAN CONTROL SEQUENCE

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COA:

Seal: COMMONWEALTH OF MASSACHUSETTS — SCOTT E. HENRIKSEN — No. 49721 — REGISTERED PROFESSIONAL ENGINEER

Issued For: BID

Scale: NTS

Key Plan:

Date:	March 30, 2022
Drawn By:	AVS
Reviewed By:	SEH
Approved By:	SEH
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title: AUTOMATIC TEMPERATURE CONTROLS

Sheet Number: H701

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ELECTRICAL ABBREVIATIONS LIST

1P	1 POLE (2P, 3P, 4P, ETC.)	AS	AMP SWITCH	CMPR	COMPRESSOR	DS	SAFETY DISCONNECT SWITCH	FIXT	FIXTURE	HTG	HEATING	LTG	LIGHTING	MOA	MULTIOUTLET ASSEMBLY	PA	PUBLIC ADDRESS	RM	ROOM	SYM	SYMMETRICAL	V	VOLT	∠	ANGLE
A	AMPERE	AT	AMP TRIP	CONN	CONNECTION	DT	DOUBLE THROW	FLR	FLOOR	HTR	HEATER	LTNG	LIGHTNING	MSP	MOTOR STARTER PANELBOARD	PB	PULL BOX OR PUSHBUTTON	RSC	RIGID STEEL CONDUIT	SYS	SYSTEM	VA	VOLT-AMPERES	@	AT
AC	ABOVE COUNTER OR AIR CONDITIONER	ATS	AUTOMATIC TRANSFER SWITCH	CONST	CONSTRUCTION	DWG	DRAWING	FLUOR	FLUORESCENT	HV	HIGH VOLTAGE	LV	LOW VOLTAGE	MSBD	MAIN SWITCHBOARD	PE	PNEUMATIC ELECTRIC	RTU	ROOF TOP UNIT	TEL	TELEPHONE	VDT	VIDEO DISPLAY TERMINAL	Δ	DELTA
		AUTO	AUTOMATIC	CONT	CONTINUATION OR CONTINUOUS	EC	ELECTRICAL CONTRACTOR	FU	FUSE	HVAC	HEATING, VENTILATING AND AIR	MAX	MAXIMUM	MT	MOUNT	PED	PEDESTAL	SC	SURFACE CONDUIT	TEL/DATA	TELEPHONE/DATA	VERT	VERTICAL	'	FEET
ACLG	ABOVE CEILING	AUX	AUXILIARY	CONTR	CONTRACTOR	ELEC	ELECTRIC, ELECTRICAL	FUDS	FUSED SAFETY DISCONNECT SWITCH		CONDITIONING	MAG.S	MAGNETIC STARTER	MT.C	EMPTY CONDUIT	PF	POWER FACTOR	SEC	SECONDARY	TERM	TERMINAL	VFD	VARIABLE FREQUENCY DRIVE	"	INCHES
ADO	AUTOMATIC DOOR OPENER	AV	AUDIO VISUAL	CONV	CONVECTOR	ELEV	ELEVATOR	GA	GAUGE	HWP	HYDRONIC WATER PUMP	MC	MOMENTARY CONTACT	MTS	MANUAL TRANSFER SWITCH	PH	PHASE	SHT	SHEET	TL	TWIST LOCK	VOL	VOLUME	#	NUMBER
AF	AMP FRAME	AWG	AMERICAN WIRE GAUGE	CP	CIRCULATING PUMP	EM	EMERGENCY	GAL	GALLON	IC	INTERRUPTING CAPACITY	MC	MECHANICAL CONTRACTOR	MTR	MOTOR, MOTORIZED	PIV	POST INDICATING VALVE	SIM	SIMILAR	TR	TAMPER RESISTANT	W	WATT	Ø	PHASE
AFF	ABOVE FINISHED FLOOR	BATT	BATTERY	CRT	CATHODE-RAY TUBE	EMS	ENERGY MANAGEMENT SYSTEM	GALV	GALVANIZED	IG	ISOLATED GROUND	MCB	MAIN CIRCUIT BREAKER	N.C.	NORMALLY CLOSED	PNL	PANEL	S/N	SOLID NEUTRAL	T-STAT	THERMOSTAT	W	WITH	C	CENTER LINE
AFG	ABOVE FINISHED GRADE	BD	BOARD	CT	CURRENT TRANSFORMER	EMT	ELECTRICAL METALLIC TUBING	GC	GENERAL CONTRACTOR	IMC	INTERMEDIATE METAL CONDUIT	MCC	MOTOR CONTROL CENTER	NEC	NATIONAL ELECTRICAL CODE	PP	POWER POLE	SPEC	SPECIFICATION	TTC	TELEPHONE TERMINAL CABINET	WG	WIRE GUARD	P	PLATE
AFI	ARC FAULT CIRCUIT INTERRUPTER	BLDG	BUILDING	CTR	CENTER	EP	ELECTRIC PNEUMATIC	GEN	GENERATOR	INCAND	INCANDESCENT	MDC	MAIN DISTRIBUTION CENTER	NEMA	NATIONAL ELECTRICAL	PR	PAIR	SPKR	SPEAKER	TV	TELEVISION	WH	WATER HEATER		
		BMS	BUILDING MANAGEMENT SYSTEM	CU	COPPER	EQUIP	EQUIPMENT	GFI	GROUND FAULT CIRCUIT INTERRUPTER	IR	INFRARED	MDP	MAIN DISTRIBUTION PANEL		MANUFACTURER'S ASSOCIATION	PRI	PRIMARY	SP	SPARE	TVTC	TELEVISION TERMINAL CABINET	W/O	WITHOUT		
AHU	AIR HANDLING UNIT	C	CONDUIT	DCP	DOMESTIC WATER CIRCULATING	EWC	ELECTRIC WATER COOLER	GFP	GROUND FAULT PROTECTOR	I/W	INTERLOCK WITH	MFR	MANUFACTURER	NFDS	NON-FUSED SAFETY DISCONNECT	PROJ	PROJECTION	SR	SURFACE RACEWAY	TYP	TYPICAL	WP	WEATHERPROOF		
AL	ALUMINUM	CAB	CABINET	PUMP		EXIST	EXISTING	GND	GROUND	J-BOX	JUNCTION BOX	MFS	MAIN FUSED DISCONNECT SWITCH		SWITCH	PRV	POWER ROOF VENTILATOR	SS	STAINLESS STEEL	UC	UNDER COUNTER	XFMR	TRANSFORMER		
ALT	ALTERNATE	CAT	CATALOG	DEPT	DEPARTMENT	EXH	EXHAUST	GRS	GALVANIZED RIGID STEEL (CONDUIT)	KV	KILOVOLT	MH	MANHOLE	NIC	NOT IN CONTRACT	PT	POTENTIAL TRANSFORMER	SSW	SELECTOR SWITCH	UE	UNDERGROUND ELECTRICAL	XFR	TRANSFER		
AMP	AMPERE	CATV	CABLE TELEVISION	DET	DETAIL	EXP	EXPLOSION PROOF	GYP BD	GYPSUM BOARD	KVA	KILOVOLT-AMPERE	MIC	MICROPHONE	NL	NIGHT LIGHT	PVC	POLYVINYL CHLORIDE (CONDUIT)	S/S	STOP/START PUSHBUTTONS	UG	UNDERGROUND				
AMPL	AMPLIFIER	CB	CIRCUIT BREAKER	DIA	DIAMETER	FA	FIRE ALARM	HOA	HANDS-OFF-AUTOMATIC SWITCH	KVAR	KILOVOLT-AMPERE REACTIVE	MIN	MINIMUM	N.O.	NORMALLY OPEN	PWR	POWER	STA	STATION	UH	UNIT HEATER				
ANNUN	ANNUNCIATOR	CCTV	CLOSED CIRCUIT TELEVISION	DISC	DISCONNECT	FABP	FIRE ALARM BOOSTER POWER SUPPLY PANEL	HORIZ	HORIZONTAL	KW	KILOWATT	MISC	MISCELLANEOUS	NPF	NORMAL POWER FACTOR	QUAN	QUANTITY	STD	STANDARD	UT	UNDERGROUND TELEPHONE				
APPROX	APPROXIMATELY	CKT	CIRCUIT	DIST	DISTRIBUTION			HP	HORSEPOWER	KWH	KILOWATT HOUR	MLO	MAIN LUGS ONLY	NTS	NOT TO SCALE	RCPT	RECEPTACLE	SURF	SURFACE MOUNTED	UTIL	UTILITY				
AQ-STAT	AQUASTAT	CLG	CEILING	DN	DOWN	FACP	FIRE ALARM CONTROL PANEL	HPF	HIGH POWER FACTOR	LOC	LOCATE OR LOCATION	MMS	MANUAL MOTOR STARTER	OH	OVERHEAD	REQD	REQUIRED	SW	SWITCH	UV	UNIT VENTILATOR OR ULTRAVIOLET				
ARCH	ARCHITECT, ARCHITECTURAL	COMB	COMBINATION	DPR	DAMPER	FCU	FAN COIL UNIT	HT	HEIGHT	LT	LIGHT	MOA	MULTIOUTLET ASSEMBLY	OL	OVERLOADS	RM	ROOM	SWBD	SWITCHBOARD						

LIGHTING/LIGHTING CONTROL LEGEND

- A 1,a — 1' X 4' PENDANT OR SURFACE MOUNTED LED FIXTURE "A" DENOTES FIXTURE TYPE; NUMERAL DENOTES CIRCUIT NUMBER. "a" SUBSCRIPT DENOTES SWITCH CONTROL WHERE SHOWN
- AE 1,a — 1' X 4' PENDANT OR SURFACE MOUNTED EMERGENCY LED FIXTURE WITH EMERGENCY BATTERY BACKUP BALLAST. PROVIDE THIRD WIRE FOR EMERGENCY MODE BYPASS IF SWITCHED (TYPICAL). "AE" DENOTES FIXTURE TYPE; NUMERAL DENOTES CIRCUIT NUMBER. "a" SUBSCRIPT DENOTES SWITCH CONTROL WHERE SHOWN
- W 1,c — WALL MOUNTED LED FIXTURE. "W" DENOTES FIXTURE TYPE, NUMERAL DENOTES CIRCUIT NUMBER, "c" SUBSCRIPT DENOTES SWITCH CONTROL WHERE SHOWN.
- WE 1,c — WALL MOUNTED EMERGENCY LED FIXTURE WITH EMERGENCY BATTERY BACKUP BALLAST. PROVIDE THIRD WIRE FOR EMERGENCY MODE BYPASS IF SWITCHED (TYPICAL). "WE" DENOTES FIXTURE TYPE; NUMERAL DENOTES CIRCUIT NUMBER. "c" SUBSCRIPT DENOTES SWITCH CONTROL WHERE SHOWN
- POLE MOUNTED LED SITE LIGHTING FIXTURE
- 5 — EXIT SIGN CEILING OR PENDANT MOUNTED. ARROWS DENOTE DIRECTION OF EGRESS. NUMERAL DENOTES CIRCUIT NUMBER. SHADED CHEVRONS DENOTE EXIT FACES.
- 5 — WALL MOUNTED EXIT SIGN. ARROWS DENOTE DIRECTION OF EGRESS. NUMERAL DENOTES CIRCUIT NUMBER. SHADED CHEVRONS DENOTE EXIT FACES.

LIGHTING CONTROL SWITCHES
(MOUNT 4'-0" AFF UNLESS NOTED OTHERWISE.)

- $a — SINGLE POLE SWITCH, "a" SUBSCRIPT DENOTES CIRCUITS CONTROLLED.
- $2a — 2 POLE SWITCH, "a" SUBSCRIPT DENOTES CIRCUITS CONTROLLED.
- $3a — 3-WAY SWITCH, "a" SUBSCRIPT DENOTES CIRCUITS CONTROLLED.
- $4a — 4-WAY SWITCH, "a" SUBSCRIPT DENOTES CIRCUITS CONTROLLED.
- $Pa — SINGLE POLE SWITCH WITH PILOT LIGHT, "a" SUBSCRIPT DENOTES CIRCUITS CONTROLLED.
- $LV1a — WALL MOUNTED DIGITAL WALL CONTROL WITH ON/OFF BUTTONS FOR EACH SWITCH LEG, "a" SUBSCRIPT DENOTES CIRCUIT CONTROLLED. PROVIDE WATTSTOPPER #LMSW SERIES OR PPROVED EQUAL
- $TCa — ELECTROMECHANICAL 7 DAY, 24HR ASTRONOMICAL TIME CLOCK BY INTERMATIC SERIES EP100C OR APPROVED EQUAL. "a" DENOTES CIRCUIT CONTROLLED
- $WPa — WEATHERPROOF SINGLE-POLE SWITCH, SUBSCRIPT "a" DENOTES CIRCUIT CONTROLLED
- PC — PHOTOCELL

ONE-LINE POWER DIAGRAM SYMBOLS

- GROUND - SYSTEM AND/OR EQUIPMENT
- 3 PHASE, 3 WIRE DELTA CONNECTION
- 3 PHASE, 3 WIRE WYE CONNECTION (UNGROUNDED)
- 3 PHASE, 4 WIRE WYE CONNECTION (GROUNDED NEUTRAL)
- CIRCUIT BREAKER
- N, E, L — AUTOMATIC TRANSFER SWITCH
- M — WATTHOUR METER
- G — GENERATOR

RACEWAY AND WIRING

- LP1B-1,3 — HOMERUN TO PANELBOARD, PROVIDE 3/2"., 2#12 & 1#12GND, NUMERALS 1 AND 3 INDICATE CIRCUITS IN PANELBOARD. RACEWAYS LARGER THAN 3/4" AND CONDUCTORS LARGER THAN #12 AWG SHALL BE INDICATED ON THE DRAWINGS.
- RACEWAY RUN UNDERGROUND OR UNDER SLAB
- RACEWAY RUN ABOVE GROUND OR EXPOSED

POWER LEGEND

- DISTRIBUTION PANEL
- PANELBOARD-SURFACE MOUNTED
- T — DRY TYPE TRANSFORMER
- GB — GROUND BUS WALL MOUNTED CHATSWORTH MODEL NO. 10622-020 EXTEND A 1/2"C, 1-#6 INSULATED GROUND TO THE BUILDING GROUND SYSTEM
- SAFETY SWITCH - RATING AND TYPE AS NOTED ON THE DRAWING.
- 30AS 20AF — FUSIBLE SAFETY SWITCH - RATING AND TYPE AS NOTED ON THE DRAWING. (30 AMP, 20 AMP FUSE, 3 POLE)
- 1 — MOTOR, NUMERAL DENOTES HORSE POWER
- T — WALL MOUNTED LINE VOLTAGE THERMOSTAT MOUNTED 54"AFF. THERMOSTAT FURNISHED BY HVAC AND INSTALLED BY ELECTRICAL CONTRACTOR.
- EWH — ELECTRIC WATER HEATER
- ATC — AUTOMATIC TEMPERATURE CONTROL PANEL
- THREE FUNCTION PUSHBUTTON SWITCH (UP/DOWN/STOP)
- CP — PACKAGE CONTROL PANEL FOR EQUIPMENT
- D — MOTORIZED DAMPER
- J — WALL MOUNTED JUNCTION BOX WITH BLANK COVERPLATE, SIZE AS REQUIRED BY N.E.C.
- J CLG — CEILING MOUNTED JUNCTION BOX WITH BLANK COVER PLATE, SIZE AS REQUIRED BY N.E.C.
- PB — PULL BOX. TYPE AS NOTED ON THE DRAWINGS OR AS REQUIRED BY N.E.C.
- VFD — VARIABLE SPEED DRIVE
- ATS — AUTOMATIC TRANSFER SWITCH

RECEPTACLE LEGEND

- DUPLEX CONVENIENCE OUTLET RATED 20A, 125V, U-SLOT GROUNDED TYPE MOUNTED 18" ABOVE FINISHED FLOOR TO CENTER LINE. ALL OTHER MOUNTING HEIGHTS SHALL BE AS NOTED ADJACENT TO THE SYMBOL.
- DOUBLE DUPLEX CONVENIENCE OUTLET RATED 20A, 125V, U-SLOT GROUNDED TYPE MOUNTED 18" ABOVE FINISHED FLOOR TO CENTER LINE. ALL OTHER MOUNTING HEIGHTS SHALL BE AS NOTED ADJACENT TO THE SYMBOL.
- DUPLEX GROUND FAULT CIRCUIT INTERRUPTER (GFCI) RATED 20A, 125V, U-SLOT GROUNDED TYPE MOUNTED 18" ABOVE FINISHED FLOOR TO CENTER LINE. ALL OTHER MOUNTING HEIGHTS SHALL BE AS NOTED ADJACENT TO THE SYMBOL.

FIRE ALARM LEGEND

- FA — CONNECT TO FIRE ALARM CONTROL PANEL
- H — FIRE ALARM SYSTEM HEAT DETECTOR (135°F RATE OF RISE)
- S — FIRE ALARM SMOKE DETECTOR. "15CD" DENOTES CANDELA RATING.
- F — FIRE ALARM SYSTEM MANUAL PULL STATION
- FM — FIRE ALARM MASTER BOX
- FACP — FIRE ALARM CONTROL PANEL
- K — KEY REPOSITORY (KNOX BOX)
- HF — FIRE ALARM SYSTEM EXTERIOR MOUNTED WEATHERPROOF RED ROTATING LOCATOR BEACON

GENERAL ELECTRICAL NOTES

1. DRAWINGS ARE DIAGRAMMATIC ONLY. THE EXACT LOCATION, MOUNTING HEIGHTS, SIZE OF EQUIPMENT AND ROUTING OF RACEWAYS SHALL BE COORDINATED AND DETERMINED IN THE FIELD.
2. THE EXACT LOCATION AND MOUNTING HEIGHTS OF ALL LIGHTING FIXTURES LOCATED IN MECHANICAL/ELECTRICAL EQUIPMENT SPACES SHALL BE COORDINATED IN THE FIELD BY THE ELECTRICAL CONTRACTOR BEFORE INSTALLATION OF SAME, SO AS TO AVOID INTERFERENCE WITH DUCTS, PIPING AND OTHER MECHANICAL/ELECTRICAL EQUIPMENT.
3. ALL STRAIGHT FEEDER, BRANCH CIRCUIT AND AUXILIARY SYSTEM CONDUIT RUNS SHALL BE PROVIDED WITH SUFFICIENT PULL BOXES TO LIMIT THE MAXIMUM LENGTH OF ANY SINGLE CABLE PULL TO 150 FEET. EXACT SIZES OF PULL BOXES AND LOCATIONS TO BE DETERMINED IN THE FIELD BY THE ELECTRICAL CONTRACTOR.
4. FURNISH ALL REQUIRED ACCESS PANELS AS REQUIRED TO SUIT FIELD CONDITIONS FOR THE PROPER OPERATION AND MAINTENANCE OF THE ELECTRICAL SYSTEM. THE EXACT SIZES AND PHYSICAL LOCATIONS SHALL BE TO SUIT ACCESSIBILITY AND CONSTRUCTION CONDITIONS. ALL ACCESS PANELS PROVIDED BY THE ELECTRICAL CONTRACTOR SHALL MATCH EXACTLY THE ACCESS PANELS FURNISHED AND INSTALLED BY THE GENERAL CONTRACTOR. THE ACCESS PANELS WILL BE INSTALLED BY THE TRADE CONTRACTOR UNDER THE APPROPRIATE SECTION OF THE SPECIFICATIONS FOR THE SURFACE IN WHICH THE PANELS ARE LOCATED.
5. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE HVAC, PLUMBING AND GENERAL CONTRACTORS AS APPLICABLE AS TO THE EXACT LOCATION OF THEIR RESPECTIVE EQUIPMENT; THE POWER WIRING, CONTROL WIRING AND ALL ELECTRICAL CONNECTIONS AND CONDUIT TURN-UPS SHALL BE COORDINATED WITH THE RESPECTIVE CONTRACTORS BEFORE THE START OF CONSTRUCTION IN THE FIELD.
6. SLEEVES ARE TO BE UTILIZED FOR PASSAGE OF CONDUITS THROUGH FLOORS OR WALLS. CONDUITS AND BOXES ARE TO BE SUPPORTED BY THE USE OF PRESET FASTENERS INSTALLED IN FLOORS, WALLS OR COLUMNS. CONDUITS AND BOXES ARE TO BE INSTALLED CONCEALED IN MASONRY WALLS AND ABOVE HUNG CEILINGS. ALL SLEEVES ARE TO BE SEALED WITH APPROVED FIRE STOPPING SEALANT.
7. ALL LIGHTING FIXTURES, ELECTRICAL DEVICES, CABLES AND RACEWAYS ARE TO BE INDEPENDENTLY SUPPORTED OF THE CEILING SYSTEM. FIXTURES ARE TO BE SUPPORTED FROM THE STRUCTURE BY THE USE OF JACK CHAIN, THREADED ROD OR OTHER MEANS APPROVED BY THE ENGINEER. CEILING SYSTEM TIE WIRES AND GRID ARE NOT TO BE UTILIZED FOR THE SUPPORT OF ELECTRICAL DEVICES, CABLES AND RACEWAYS. APPROVED SUPPORTS, HANGERS, CLIPS, ETC. ARE TO BE UTILIZED.
8. COMBINED HOMERUNS OF TWO (2) OR THREE (3) CIRCUITS MAY BE UTILIZED. HOWEVER, THE NEUTRAL CONDUCTOR IS TO BE INCREASED TO #10AWG. COMBINED HOMERUNS ARE TO BE LIMITED TO 20A, LIGHTING AND POWER CIRCUITS.
9. INSTALLATION OF BACK TO BACK DEVICES ARE TO BE AVOIDED. ALLOW ONE WALL FRAMING MEMBER BETWEEN EACH BACK TO BACK DEVICE AS A MINIMUM.
10. WORK SHALL CONFORM TO THE MASSACHUSETTS ELECTRICAL CODE, MASSACHUSETTS BUILDING CODE, NFPA AND REQUIREMENTS OF LOCAL AUTHORITIES HAVING JURISDICTION.
11. THE WORD "CONTRACTOR" AS USED IN THE "ELECTRICAL WORK" SHALL MEAN THE ELECTRICAL SUBCONTRACTOR.
12. CONTRACTOR SHALL PAY FOR ALL PERMITS, INSURANCE AND TESTS, AND SHALL PROVIDE LABOR AND MATERIAL TO COMPLETE THE ELECTRICAL WORK SHOWN.
13. OWNER SHALL PAY ELECTRIC UTILITY COMPANY BACKCHARGES
14. CONTRACTOR SHALL PROVIDE ALL REQUIRED COORDINATION WITH ELECTRIC UTILITY.
15. EXCEPT AS OTHERWISE NOTED, THE ELECTRICAL WORK SHALL INCLUDE PANELBOARDS, CIRCUIT BREAKERS, FEEDERS, WIRING, RACEWAYS, LIGHTING FIXTURES, DEVICES, SAFETY SWITCHES, FIRE ALARM, TRANSFORMERS AND CONNECTION NECESSARY TO OPERATE MOTORS AND OTHER EQUIPMENT.
16. AUTOMATIC TEMPERATURE CONTROLS SHALL BE PROVIDED AND INSTALLED BY THE MECHANICAL SUBCONTRACTOR. STARTERS, VFD'S AND OTHER CONTROL DEVICES FOR EQUIPMENT SHALL BE FURNISHED BY THE MECHANICAL SUBCONTRACTOR FOR INSTALLATION AND CONNECTION BY THIS CONTRACTOR.
17. THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY LIGHTING AND POWER AND THE GENERAL CONTRACTOR SHALL PAY ALL ENERGY CHARGES FOR TEMPORARY POWER AND LIGHTING.
18. DURING CONSTRUCTION, THE ELECTRICAL CONTRACTOR SHALL KEEP HIS PORTION OF THE WORK NEAT, CLEAN AND ORDERLY.
19. ALL SYSTEMS SHALL BE TESTED FOR SHORT CIRCUIT AND GROUNDS PRIOR TO ENERGIZING AND ANY DEFECTS SHALL BE CORRECTED.
20. ALL CUTTING AND PATCHING REQUIRED FOR ELECTRICAL WORK SHALL BE INCLUDED AS PART OF THIS SECTION.
21. COMPLETE SHOP DRAWINGS SHALL BE SUBMITTED FOR ELECTRICAL EQUIPMENT. WHERE SPECIFIED ELECTRICAL EQUIPMENT IS SUBSTITUTED, THE ELECTRICAL CONTRACTOR SHALL SUBMIT COMPLETE SPECIFICATIONS ON THE SUBSTITUTE AS WELL AS THE ITEM ORIGINALLY SPECIFIED.
22. MATERIALS SHALL BE SPECIFICATION GRADE AND UL LISTED.
23. WHERE MATERIAL IS CALLED OUT IN THE LEGEND BY MANUFACTURER, TYPE OR CATALOG NUMBER, SUCH DESIGNATIONS ARE TO ESTABLISH STANDARDS OR DESIRED QUALITY. ACCEPTANCE OR REJECTIONS OF PROPOSED SUBSTITUTIONS SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER.
24. WORK SHALL BE COORDINATED WITH THAT OF OTHER TRADES TO ELIMINATE INTERFERENCES.
25. ELECTRICAL WORK SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL COMPLETION.
26. WORK SHALL BE GROUNDED IN ACCORDANCE WITH CODE REQUIREMENTS. COMPLETE EQUIPMENT (INSULATED GREEN WIRE) GROUNDING SYSTEM SHALL BE INSTALLED.
27. WIRE SHALL BE TYPE "THHN-THWN" INSULATED FOR 600 VOLTS, MINIMUM SIZE #12 AWG COPPER UNLESS SPECIFICALLY NOTED OTHERWISE.
29. WIRING METHODS:
    - A. EXTERIOR UNDERGROUND FEEDERS SHALL BE PVC SCHEDULE 80 FOR DIRECT BURIED AND PVC SCHEDULE 40 FOR CONCRETE ENCASED.
    - B. EXTERIOR ABOVE GRADE FEEDERS SHALL BE RGS CONDUIT.
    - C. INTERIOR FEEDERS EXPOSED OR BURIED IN CONCRETE WALLS/SLABS SHALL BE RGS CONDUIT.
    - D. INTERIOR BRANCH CIRCUITS FOR HVAC, PLUMBING AND FIRE PROTECTION EQUIPMENT SHALL BE RGS.
    - E. LIGHTING FIXTURE CONNECTIONS SHALL BE MC CABLE.
    - F. EQUIPMENT CONNECTIONS SHALL BE LIQUID TIGHT FLEXIBLE METAL CONDUIT.
    - G. FIRE ALARM SYSTEM WIRING RUN EXPOSED OR IN CONCRETE WALLS/SLABS SHALL BE EMT CONDUIT.
30. NO CONDUIT OR WIRE SHALL BE RUN IN OR BELOW SLAB WITHOUT ENGINEER APPROVAL OR NOTED OTHERWISE ON THE PLANS.
31. FURNISH AND INSTALL SLEEVES IN FLOORS, BEAMS, WALLS, ETC. REQUIRED FOR INSTALLING THIS WORK.
32. CONDUIT PASSING THROUGH FIRE RATED WALLS AND FLOORS SHALL BE PROVIDED WITH ALL NECESSARY MATERIALS TO ENSURE THAT THE FIRE RATED INTEGRITY IS MAINTAINED.
33. FEEDER TAPS WILL NOT BE ALLOWED IN PANELBOARD GUTTERS.
34. PROVIDE AS-BUILT "CADD" DRAWINGS AT THE COMPLETION OF THE PROJECT.
35. ELECTRICAL CONTRACTOR SHALL LABEL ALL ELECTRICAL DEVICES INCLUDING BUT NOT LIMITED TO RECEPTACLES, TEL/DATA OUTLETS, DISCONNECT SWITCHES, PANELBOARDS, THERMAL MOTOR SWITCHES, CONTROL PANELS, JUNCTION BOXES, ETC.
    - A. RECEPTACLES - PANEL NAME AND CIRCUIT DESIGNATION
    - B. TEL/DATA OUTLETS - NUMBER OF DATA AND TELEPHONE PORTS
    - C. DISCONNECTS - PANEL NAME, CIRCUIT DESIGNATION AND EQUIPMENT SERVING.
    - D. THERMAL MOTOR SWITCHES - PANEL NAME, CIRCUIT DESIGNATION AND EQUIPMENT SERVING.
    - E. ENCLOSED CIRCUIT BREAKERS - PANEL NAME, CIRCUIT DESIGNATION AND EQUIPMENT SERVING.
    - F. PANELBOARDS - PANEL NAME, VOLTAGE, AMPERAGE, PHASE AS WELL AS PANEL AND CIRCUIT IT IS FED FROM.
    - G. CONTROL PANEL - PANEL NAME AND CIRCUIT DESIGNATION
    - H. JUNCTION BOXES - PANEL NAME AND CIRCUIT DESIGNATION
36. ADDRESS QUESTIONS TO THE ENGINEER IN WRITING BEFORE AWARD OF CONTRACT, OTHERWISE ENGINEER INTERPERTATION OF MEANING AND INTENT OF DRAWINGS SHALL BE FINAL.

E_Electrical Drawings Schedule

SHEET	DESCRIPTION
E001	ELECTRICAL TITLE SHEET
E002	ELECTRICAL SITE POWER PLAN
E101	ELECTRICAL PLANS
E501	ELECTRICAL DETAILS SHEET I
E502	ELECTRICAL DETAILS SHEET II
E503	ELECTRICAL DETAILS SHEET III
E601	ELECTRICAL DIAGRAMS
E602	ELECTRICAL SCHEDULES SHEET I

Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD CHATHAM, MA 02633

WELL 10 AND 11 PUMPING AND TREATMENT DESIGN MILL HIL ROAD
CHATHAM, MA 02633

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Consultants:

Revisions:

No.	Date	Description

COA:

Seal:
COMMONWEALTH OF MASSACHUSETTS — ROBERT F. McALEER — ELECTRICAL — No. 48017 — REGISTERED PROFESSIONAL ENGINEER

Issued For:
BID

Scale: NTS

Key Plan:

NORTH

Date:	MARCH 30, 2022
Drawn By:	DNM
Reviewed By:	RFM
Approved By:	RFM
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
ELECTRICAL TITLE SHEET

Sheet Number:
E001

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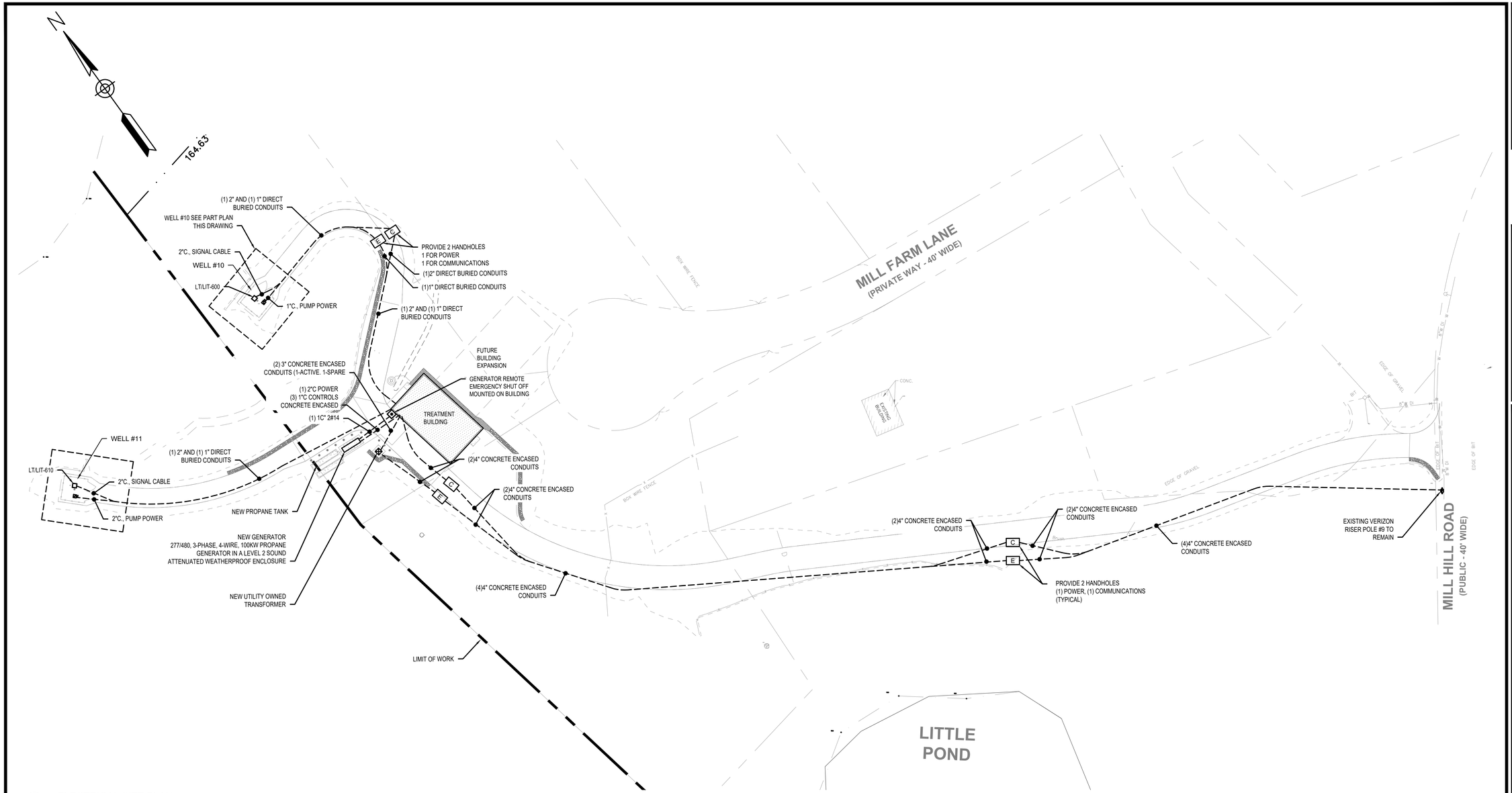

1 ELECTRICAL SITE PLAN

SCALE: 1" = 40'-0"

DRAWING NOTES:

1. REFER TO DRAWING E001 FOR LEGEND, ABBREVIATIONS AND GENERAL NOTES

40 20 0 40 80

SCALE: 1"=40'

Project:

CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD
CHATHAM, MA 02633

WELLS 10 & 11 PUMPING AND TREATMENT DESIGN
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Consultants:

Revisions:

No.	Date	Description

COA:

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Seal:

COMMONWEALTH OF MASSACHUSETTS
ROBERT F. McALEER
ELECTRICAL
No. 48017
REGISTERED
PROFESSIONAL ENGINEER

Issued For:

BID

Scale: 1"= 40'-0"

Date: MARCH 30, 2022
Drawn By: DNM
Reviewed By: RFM
Approved By: DNM

W&S Project No.: ENG21-1001
W&S File No.:

Drawing Title:

ELECTRICAL SITE PLAN

Sheet Number:

E002

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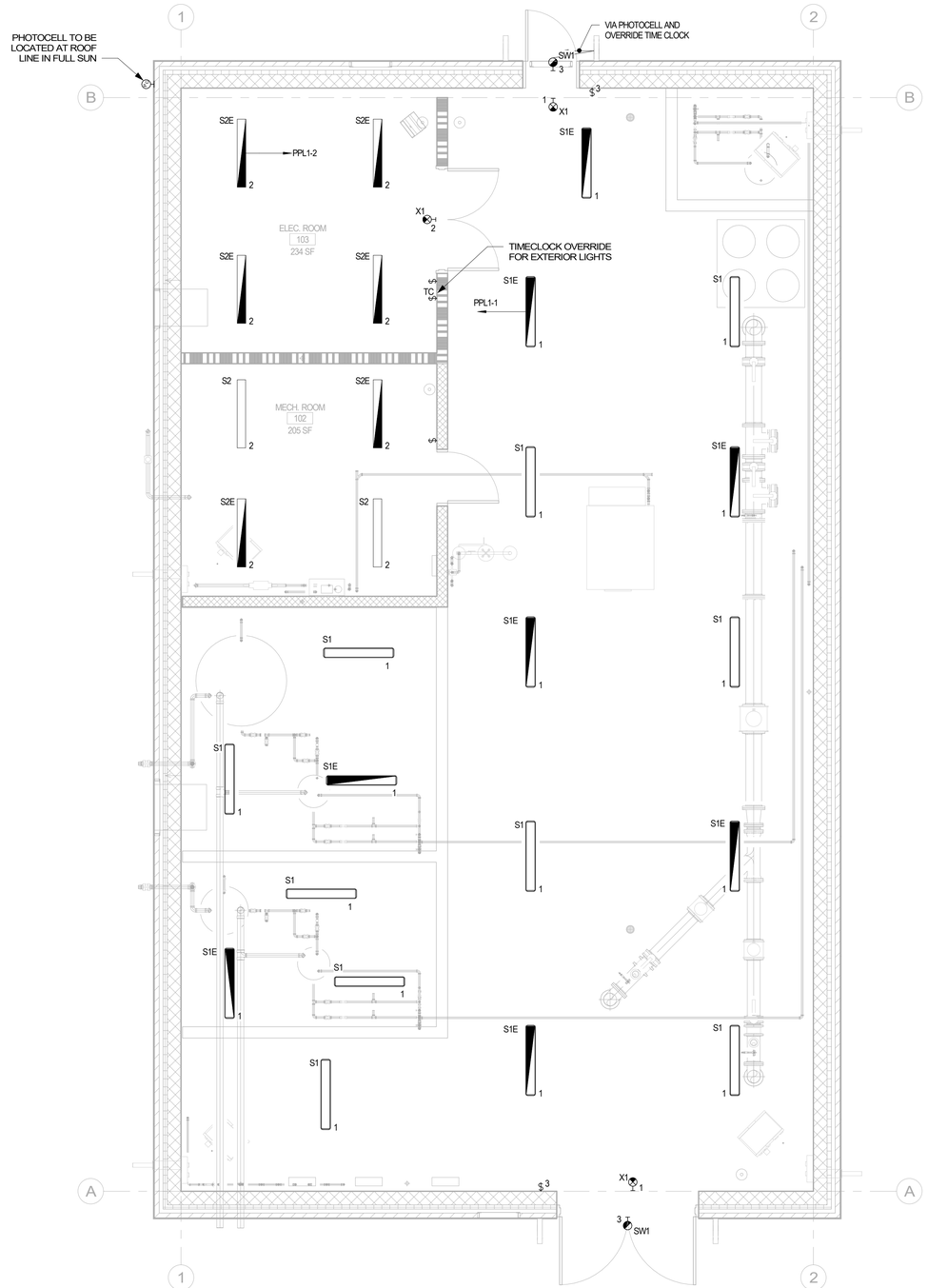
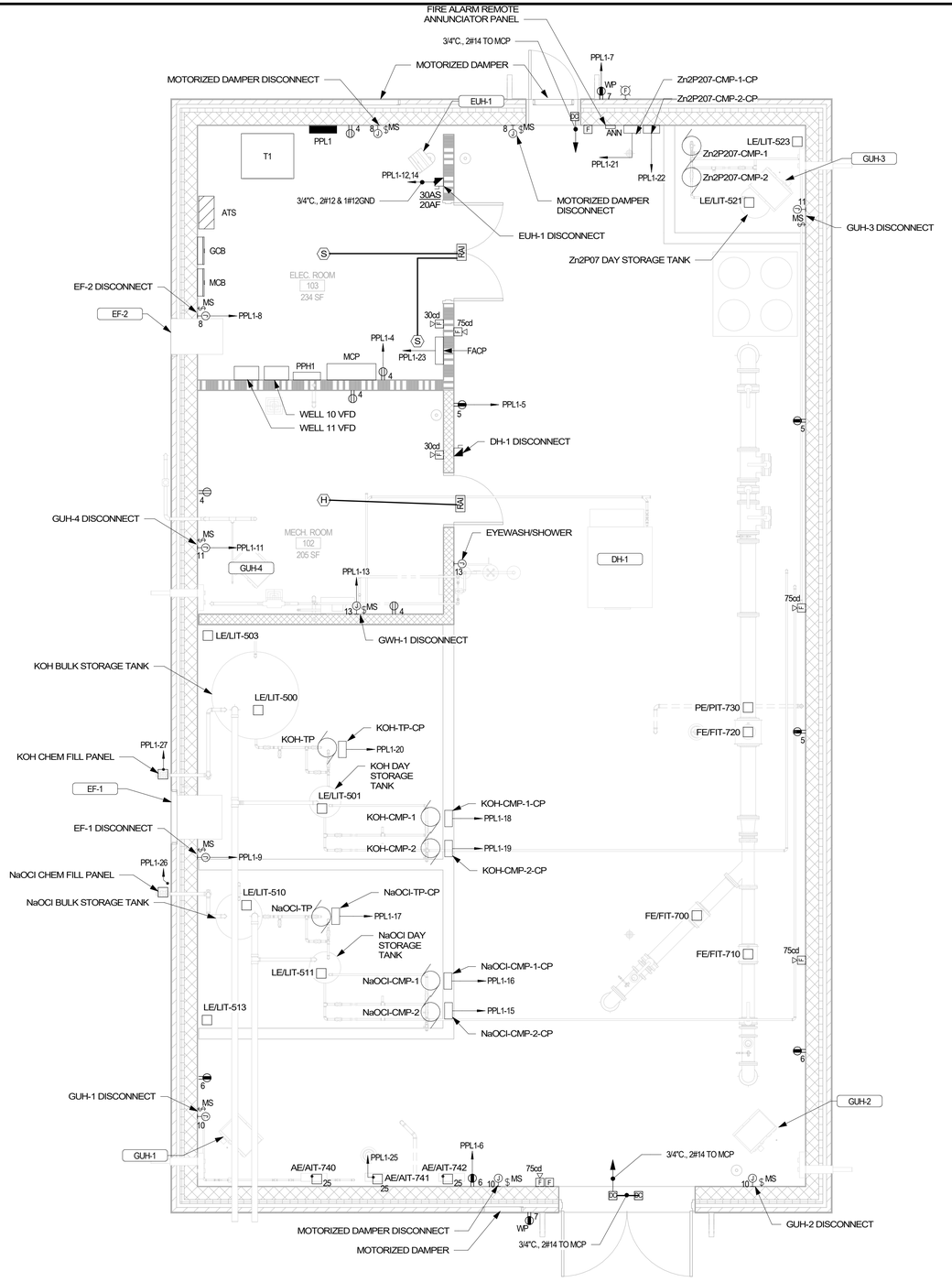
Time/05 Issued/WSE Projects/MA/Chatham MA/Wells 10 and 11 - Pumping and Treatment Design/CAD/Electrical/E002 - Site Plan.dwg

PPL1-3



1 Overall Lighting Plan-01
1/4" = 1'-0"



2 Overall-Power Plan-01
1/4" = 1'-0"

Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD CHATHAM, MA 02633

WELL 10 AND 11 PUMPING AND TREATMENT DESIGN MILL HIL ROAD CHATHAM, MA 02633

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No.	Date	Description

COA:

Seal:

COMMONWEALTH OF MASSACHUSETTS
ROBERT F. McALEER
ELECTRICAL
No. 48017
REGISTERED PROFESSIONAL ENGINEER

Issued For:
BID

Scale: 1/4" = 1'-0"

Key Plan:

NORTH

Date:	MARCH 30, 2022
Drawn By:	DNM
Reviewed By:	RFM
Approved By:	RFM
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
ELECTRICAL PLANS

Sheet Number:
E101

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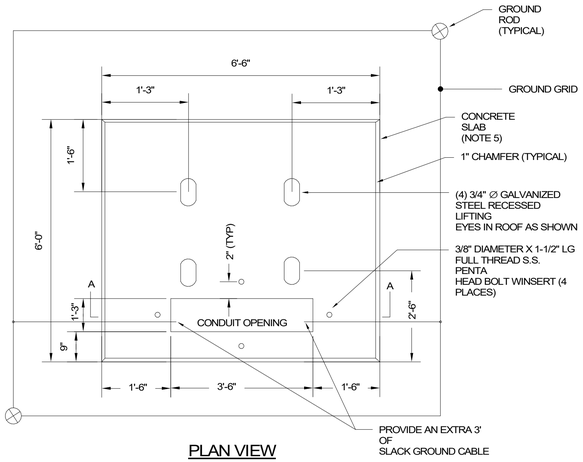
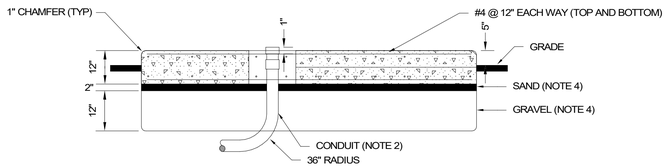


PLAN VIEW

NOT TO SCALE



SECTION A-A

NOT TO SCALE

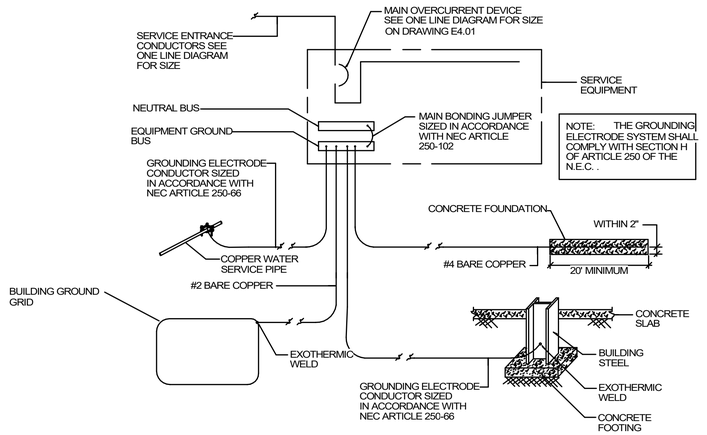
1 PAD MOUNTED TRANSFORMER DETAIL
NOT TO SCALE

PADMOUNT - FOUNDATION NOTES:

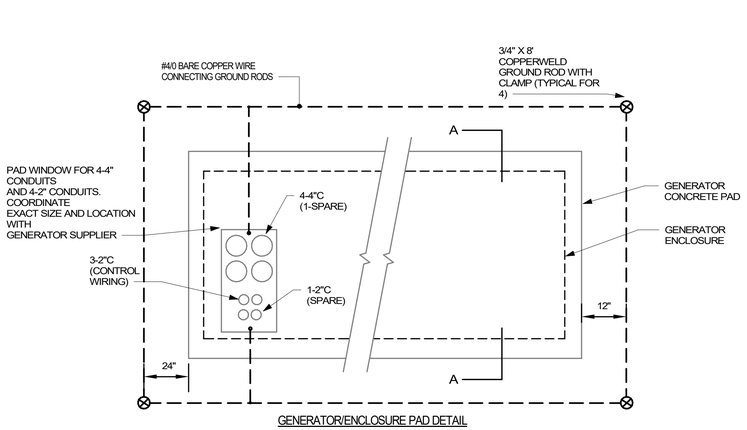
1. SCOPE - THIS STANDARD COVERS SPECIFICATIONS FOR THE CONSTRUCTION OF PADMOUNT TRANSFORMER FOUNDATIONS AND GROUNDING FOR EVERSOURCE.
2. CONDUIT BY ELECTRICAL CONTRACTOR - INSTALL AS SHOWN BEFORE SLAB IS POURED. USE 36" RADIUS BENDS, WITH COUPLINGS, NIPPLES AND BUSHINGS AS REQUIRED. (MATERIAL MAY BE GALVANIZED STEEL, BLACK IRON, OR TYPE II FIBER OR PLASTIC.) TERMINATIONS OF CONDUITS SHALL BE LOCATED EXACTLY AS SHOWN, SOLID OR DOTTED, DEPENDING UPON NUMBER OF DUCTS. THE NIPPLE AND BUSHING SHOULD BE INSTALLED AFTER THE TRANSFORMER IS PLACED AND BEFORE THE CABLES ARE PULLED.
3. GROUND GRID BY ELECTRICAL CONTRACTOR -INSTALL #1/0 S.D. 7 STRAND BARE COPPER WIRE LOOP 1'-0" BELOW GRADE. BOND TO ALL EXPOSED METALLIC CONDUIT AND LEAVE 3'-0" OF WIRE ABOVE PAD FOR GROUNDING TRANSFORMER AT TWO OPPOSITE POINTS IN THE CABLE CONDUIT OPENINGS. 3.A. PHOS-COPPER BRAZE CONNECTIONS, CADWELD, OR USE TWO APPROVED CONNECTORS PER JOINT. INSTALL TWO 8 FT. GALVANIZED STEEL (3'4") GROUND RODS WHERE SHOWN. LEAVE GRID EXPOSED UNTIL INSPECTED BY THE UTILITY COMPANY.
4. GRAVEL & SAND BY GENERAL CONTRACTOR -SHALL BE PLACED AS SHOWN IN FIGS. 1 AND 2; THE GRAVEL BEING COMPACTED AND THE SAND THOROUGHLY WETTED JUST BEFORE PLACING THE CONCRETE.
5. CONCRETE SLAB BY GENERAL CONTRACTOR CONCRETE IN ACCORDANCE WITH UTILITY COMPANY REQUIREMENTS. REINFORCE WITH 1/2" RODS LOCATED ON A 12" X 12" GRID AND LOCATED IN THE MIDDLE OF THE SLAB.
6. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE UTILITY COMPANY FOR ALL INSTALLATION REQUIREMENTS PRIOR TO THE START OF ANY WORK.

EVERSOURCE MINIMUM PAD REQUIREMENTS

1. CONCRETE MINIMUM STRENGTH, 5000 PSI @ 28 DAYS.
2. STEEL REINFORCEMENT - ASTM A615, GRADE 60.
3. MINIMUM STEEL COVER, 1-1/2 INCHES.
4. DESIGN LOADING – AASHTO HS20-44.
5. DESIGN SPECIFICATIONS – ACI 318 & AASHTO LOAD FACTOR DESIGN METHOD.
6. REINFORCED TO SUPPORT H-20 WHEEL LOAD.
7. MANUFACTURERS NAME TO BE STENCILED ON VERTICAL WALL OF CUTOUT OPENING.

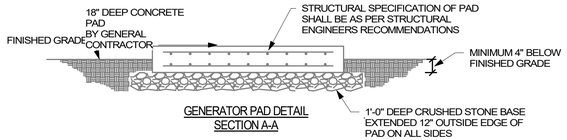

SERVICE ENTRANCE CONDUCTORS SEE ONE LINE DIAGRAM FOR SIZE
MAIN OVERCURRENT DEVICE SEE ONE LINE DIAGRAM FOR SIZE ON DRAWING E4.01
SERVICE EQUIPMENT
NEUTRAL BUS
EQUIPMENT GROUND BUS
MAIN BONDING JUMPER SIZED IN ACCORDANCE WITH NEC ARTICLE 250-102
NOTE: THE GROUNDING ELECTRODE SYSTEM SHALL COMPLY WITH SECTION H OF ARTICLE 250 OF THE N.E.C. .
GROUNDING ELECTRODE CONDUCTOR SIZED IN ACCORDANCE WITH NEC ARTICLE 250-66
CONCRETE FOUNDATION
WITHIN 2"
COPPER WATER SERVICE PIPE
#4 BARE COPPER
20" MINIMUM
#2 BARE COPPER
BUILDING GROUND GRID
CONCRETE SLAB
BUILDING STEEL
EXOTHERMIC WELD
EXOTHERMIC WELD
GROUNDING ELECTRODE CONDUCTOR SIZED IN ACCORDANCE WITH NEC ARTICLE 250-66
CONCRETE FOOTING

3 Service Grounding Detail
NOT TO SCALE


#4/0 BARE COPPER WIRE CONNECTING GROUND RODS
3/4" X 8' COPPERWELD GROUND ROD WITH CLAMP (TYPICAL FOR 4)
A
PAD WINDOW FOR 4-4" CONDUITS AND 4-2" CONDUITS. COORDINATE EXACT SIZE AND LOCATION WITH GENERATOR SUPPLIER
4-4"C (1-SPARE)
GENERATOR CONCRETE PAD
GENERATOR ENCLOSURE
3-2"C (CONTROL WIRING)
1-2"C (SPARE)
12"
24"
A

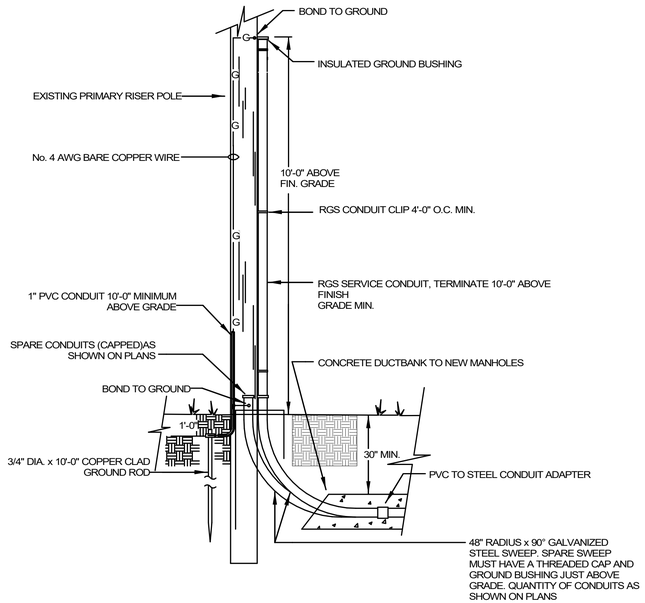
GENERATOR/ENCLOSURE PAD DETAIL

PAD DIMENSIONS SHALL BE PER GENERATOR MANUFACTURER RECOMMENDATIONS

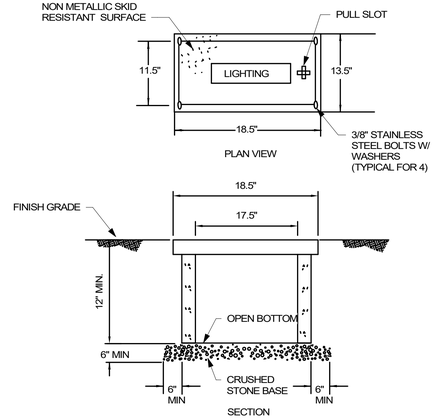

18" DEEP CONCRETE PAD BY GENERAL CONTRACTOR
FINISHED GRADE
STRUCTURAL SPECIFICATION OF PAD SHALL BE AS PER STRUCTURAL ENGINEERS RECOMMENDATIONS
MINIMUM 4" BELOW FINISHED GRADE
1'-0" DEEP CRUSHED STONE BASE EXTENDED 12" OUTSIDE EDGE OF PAD ON ALL SIDES

GENERATOR PAD DETAIL
SECTION A-A

2 GENERATOR/ENCLOSURE PAD DETAIL
NOT TO SCALE


BOND TO GROUND
INSULATED GROUND BUSHING
EXISTING PRIMARY RISER POLE
No. 4 AWG BARE COPPER WIRE
10'-0" ABOVE FIN. GRADE
RGS CONDUIT CLIP 4'-0" O.C. MIN.
RGS SERVICE CONDUIT, TERMINATE 10'-0" ABOVE FINISH GRADE MIN.
1" PVC CONDUIT 10'-0" MINIMUM ABOVE GRADE
SPARE CONDUITS (CAPPED)AS SHOWN ON PLANS
CONCRETE DUCTBANK TO NEW MANHOLES
BOND TO GROUND
1'-0"
30" MIN.
3/4" DIA. x 10'-0" COPPER CLAD GROUND ROD
PVC TO STEEL CONDUIT ADAPTER
48" RADIUS x 90° GALVANIZED STEEL SWEEP. SPARE SWEEP MUST HAVE A THREADED CAP AND GROUND BUSHING JUST ABOVE GRADE. QUANTITY OF CONDUITS AS SHOWN ON PLANS

4 Typical Riser Pole Detail
NOT TO SCALE



NOTES:

1. THIS HANDHOLE IS INTENDED FOR NON-DELIBERATE VEHICULAR TRAFFIC ONLY.
2. HANDHOLE SHALL BE PREFABRICATED POLYMER CONCRETE AGGREGATE EQUAL TO QUAZITE OR EQUAL PRECAST CONCRETE CONSTRUCTION.

5 Handhole Detail
NOT TO SCALE

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Project:
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Issued For:
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Scale: NTS

Key Plan:

NORTH

Date:	MARCH 30, 2022
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Reviewed By:	RFM
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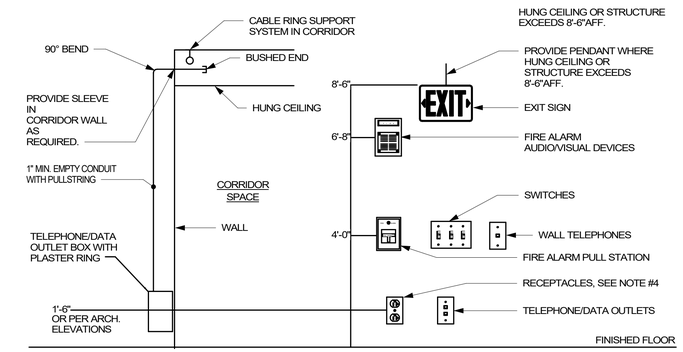
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
ELECTRICAL DETAILS
SHEET I

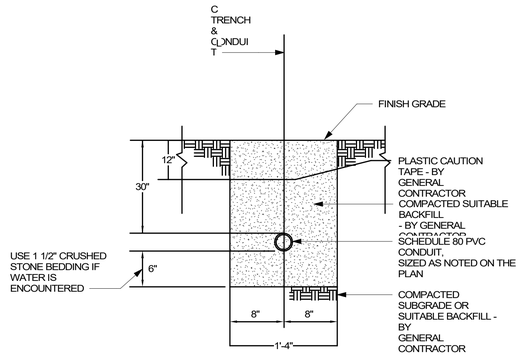
Sheet Number:
E501



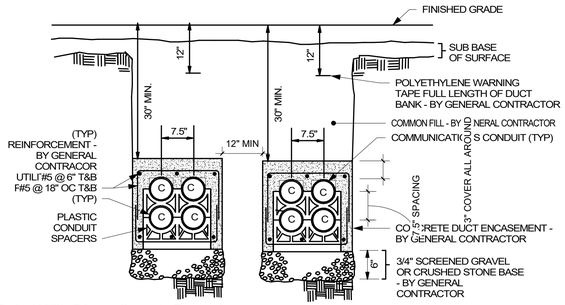
NOTES:

1. ALL MOUNTING HEIGHTS SHALL BE MEASURED FROM FINISHED FLOOR TO CENTERLINE OF DEVICE EXCEPT EXIT SIGNS.
2. DEVICES SHALL BE INSTALLED ON A COMMON VERTICAL CENTERLINE WHEREVER POSSIBLE.
3. ALL DEVICES SHALL BE INSTALLED AT MOUNTING HEIGHTS AS INDICATED ON THIS DETAIL UNLESS OTHERWISE NOTED ON ARCH. ELEVATIONS & DETAILS.

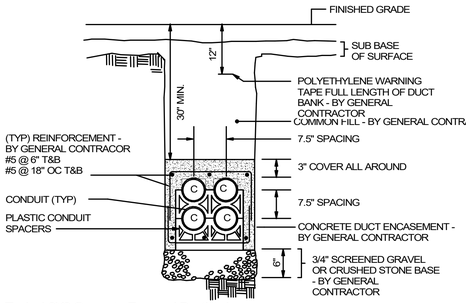
1 Typical Device Mounting Height Detail
NOT TO SCALE



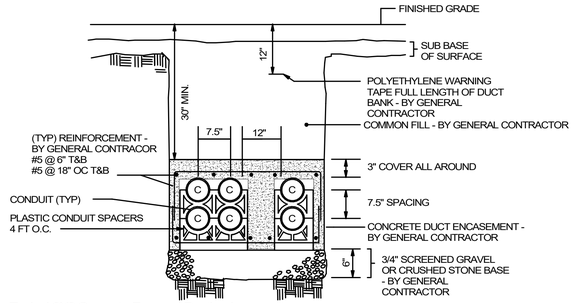
2 Typical Single Direct Buried Conduit Detail
1/8" = 1'-0"


FINISHED GRADE
12"
SUB BASE OF SURFACE
30" MIN.
POLYETHYLENE WARNING TAPE FULL LENGTH OF DUCT BANK - BY GENERAL CONTRACTOR
(TYP) REINFORCEMENT - BY GENERAL CONTRACOR UTILITY #5 @ 6" T&B #5 @ 18" OC T&B (TYP)
7.5"
12" MIN.
COMMON FILL - BY GENERAL CONTRACTOR
COMMUNICATIONS CONDUIT (TYP)
PLASTIC CONDUIT SPACERS
7.5" SPACING
3" COVER ALL AROUND
CONCRETE DUCT ENCASEMENT - BY GENERAL CONTRACTOR
6"
3/4" SCREENED GRAVEL OR CRUSHED STONE BASE - BY GENERAL CONTRACTOR

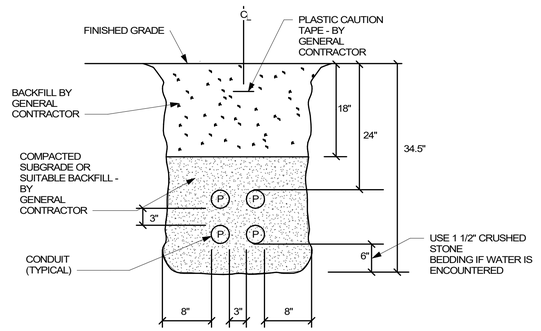
3 Typical Utility Primary Concrete Encased Ductbank
NOT TO SCALE


FINISHED GRADE
12"
SUB BASE OF SURFACE
30" MIN.
POLYETHYLENE WARNING TAPE FULL LENGTH OF DUCT BANK - BY GENERAL CONTRACTOR
COMMON FILL - BY GENERAL CONTRACTOR
(TYP) REINFORCEMENT - BY GENERAL CONTRACOR #5 @ 6" T&B #5 @ 18" OC T&B
7.5" SPACING
3" COVER ALL AROUND
CONDUIT (TYP)
7.5" SPACING
PLASTIC CONDUIT SPACERS
CONCRETE DUCT ENCASEMENT - BY GENERAL CONTRACTOR
6"
3/4" SCREENED GRAVEL OR CRUSHED STONE BASE - BY GENERAL CONTRACTOR

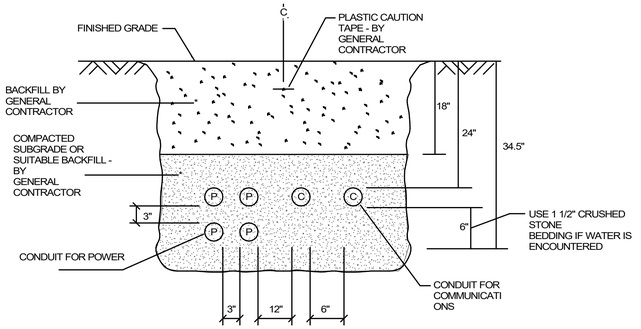
4 Typical 2X2 Concrete Encased Ductbank Detail
NOT TO SCALE


FINISHED GRADE
12"
SUB BASE OF SURFACE
30" MIN.
7.5"
12"
POLYETHYLENE WARNING TAPE FULL LENGTH OF DUCT BANK - BY GENERAL CONTRACTOR
COMMON FILL - BY GENERAL CONTRACTOR
(TYP) REINFORCEMENT - BY GENERAL CONTRACOR #5 @ 6" T&B #5 @ 18" OC T&B
3" COVER ALL AROUND
CONDUIT (TYP)
7.5" SPACING
PLASTIC CONDUIT SPACERS 4 FT O.C.
CONCRETE DUCT ENCASEMENT - BY GENERAL CONTRACTOR
6"
3/4" SCREENED GRAVEL OR CRUSHED STONE BASE - BY GENERAL CONTRACTOR

5 Typical 2X2 Concrete Encased Ductbank with Communications
NOT TO SCALE

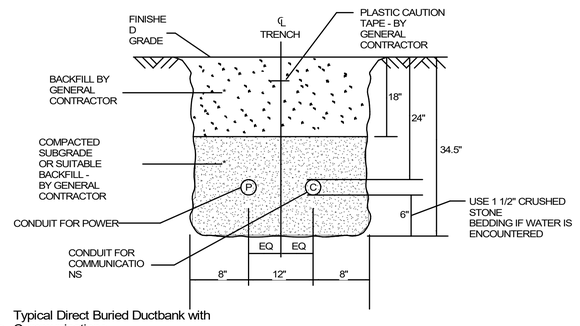


6 Typical 2x2 Direct Buried Ductbank
NOT TO SCALE

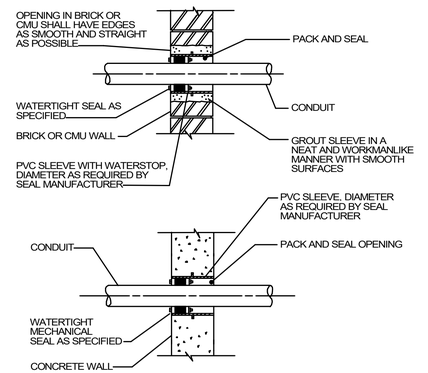


TYPICAL DIRECT BURIED CONDUIT DETAIL

7 Typical 2x2 Direct Buried Ductbank with Communications
NOT TO SCALE



8 Typical Direct Buried Ductbank with Communications
NOT TO SCALE


OPENING IN BRICK OR CMU SHALL HAVE EDGES AS SMOOTH AND STRAIGHT AS POSSIBLE
PACK AND SEAL
WATERTIGHT SEAL AS SPECIFIED
CONDUIT
BRICK OR CMU WALL
GROUT SLEEVE IN A NEAT AND WORKMANLIKE MANNER WITH SMOOTH SURFACES
PVC SLEEVE WITH WATERSTOP, DIAMETER AS REQUIRED BY SEAL MANUFACTURER
PVC SLEEVE, DIAMETER AS REQUIRED BY SEAL MANUFACTURER
CONDUIT
PACK AND SEAL OPENING
WATERTIGHT MECHANICAL SEAL AS SPECIFIED
CONCRETE WALL

9 Watertight Conduit Penetration
NOT TO SCALE

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Project:
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ELECTRICAL
No. 48017
REGISTERED
PROFESSIONAL ENGINEER

Issued For:
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Scale: NTS

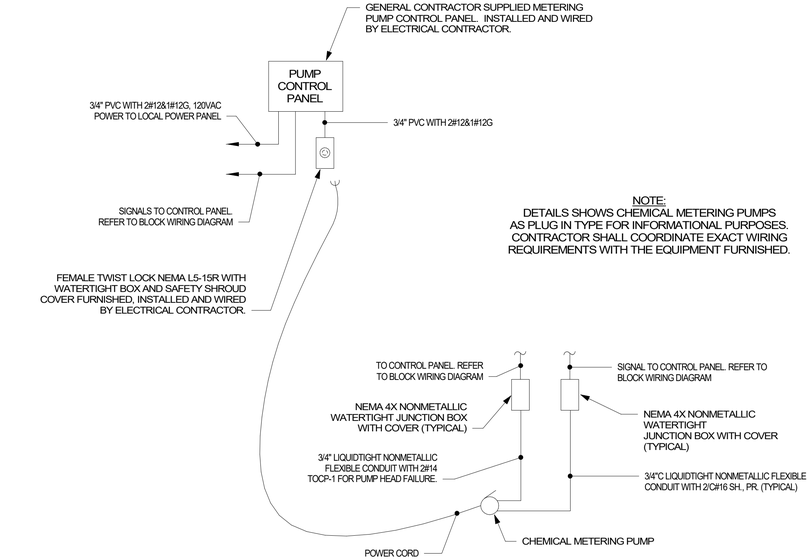
Key Plan:

NORTH

Date:	MARCH 30, 2022
Drawn By:	DNM
Reviewed By:	RFM
Approved By:	RFM
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

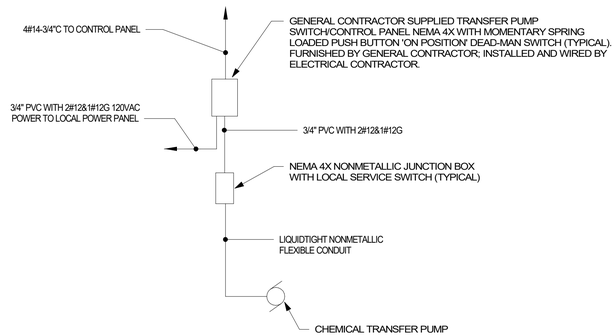
Drawing Title:
ELECTRICAL DETAILS SHEET II

Sheet Number:
E502

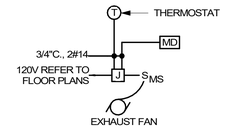

GENERAL CONTRACTOR SUPPLIED METERING PUMP CONTROL PANEL. INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.
PUMP CONTROL PANEL
3/4" PVC WITH 2#12&1#12G, 120VAC POWER TO LOCAL POWER PANEL
3/4" PVC WITH 2#12&1#12G
SIGNALS TO CONTROL PANEL. REFER TO BLOCK WIRING DIAGRAM
FEMALE TWIST LOCK NEMA L5-15R WITH WATERTIGHT BOX AND SAFETY SHROUD COVER FURNISHED, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.
TO CONTROL PANEL. REFER TO BLOCK WIRING DIAGRAM
SIGNAL TO CONTROL PANEL. REFER TO BLOCK WIRING DIAGRAM
NEMA 4X NONMETALLIC WATERTIGHT JUNCTION BOX WITH COVER (TYPICAL)
NEMA 4X NONMETALLIC WATERTIGHT JUNCTION BOX WITH COVER (TYPICAL)
3/4" LIQUIDTIGHT NONMETALLIC FLEXIBLE CONDUIT WITH 2#14 TOCP-1 FOR PUMP HEAD FAILURE.
3/4"C LIQUIDTIGHT NONMETALLIC FLEXIBLE CONDUIT WITH 2/C#16 SH., PR. (TYPICAL)
POWER CORD
CHEMICAL METERING PUMP

NOTE:
DETAILS SHOWS CHEMICAL METERING PUMPS AS PLUG IN TYPE FOR INFORMATIONAL PURPOSES. CONTRACTOR SHALL COORDINATE EXACT WIRING REQUIREMENTS WITH THE EQUIPMENT FURNISHED.

1 TYPICAL CHEMICAL METERING PUMP INSTALLATION DETAIL
NOT TO SCALE


4#14-3/4"C TO CONTROL PANEL
GENERAL CONTRACTOR SUPPLIED TRANSFER PUMP SWITCH/CONTROL PANEL NEMA 4X WITH MOMENTARY SPRING LOADED PUSH BUTTON 'ON POSITION' DEAD-MAN SWITCH (TYPICAL). FURNISHED BY GENERAL CONTRACTOR; INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.
3/4" PVC WITH 2#12&1#12G 120VAC POWER TO LOCAL POWER PANEL
3/4" PVC WITH 2#12&1#12G
NEMA 4X NONMETALLIC JUNCTION BOX WITH LOCAL SERVICE SWITCH (TYPICAL)
LIQUIDTIGHT NONMETALLIC FLEXIBLE CONDUIT
CHEMICAL TRANSFER PUMP

2 TYPICAL CHEMICAL TRANSFER PUMP INSTALLATION DETAIL
NOT TO SCALE



3 EXHAUST FAN CONTROL WIRING
N.T.S.

STRUCTURAL CEILING.
EXPANSION ANCHOR (TYPICAL)
ROD COUPLER, HEXNUT AND WASHER ASSEMBLY
SEE NOTES #5 & 6.
3/4" THREADED RODLENGTH AS REQUIRED
SEE NOTES #5 & 7.
VIBRATION ISOLATOR, TYPICAL FOR FOUR (4)
PROVIDE NEOPRENE VIBRATION ISOLATION, MASON INDUSTRIES "SUPER W" PAD, OR APPROVED EQUAL.
TWO (2) 3/4" HEX NUTS AND LOCK WASHER, TYPICAL.
DRY-TYPE TRANSFORMER
STEEL UNISTRUT ASSEMBLY TWO (2) CHANNELS MOUNTED BACK TO BACK AND WELDED ON 3" CENTERS

NOTES:

1. COORDINATE THREADED ROD AND METAL CHANNEL SIZING WITH STRUCTURAL ENGINEER.
2. REFER TO SEISMIC REQUIREMENTS FOR PROPER MOUNTING
3. COORDINATE MOUNTING HEIGHT ABOVE FINISHED FLOOR WITH PANEL AND MISCELLANEOUS EQUIPMENT.
4. TRANSFORMER SHALL BE BOLTED TO UNISTRUT ASSEMBLY AT A MINIMUM OF FOUR (4) LOCATIONS. UTILIZE BOLTS AND SPRING NUTS.
5. FEEDER ASSEMBLY SHOWN IS TYPICAL FOR THE PRIMARY AND SECONDARY. EXACT ARRANGEMENT SHALL BE DETERMINED IN THE FIELD.
6. EMT CONDUIT WITH COMPRESSION FITTING OR AS OTHERWISE REQUIRED BY SPECIFICATION.
7. LIQUID-TIGHT FLEXIBLE CONDUIT 18" LONG MINIMUM.

4 TRAPEZE MOUNTED TRANSFORMER
NOT TO SCALE

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PROFESSIONAL ENGINEER

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BID

Scale: NTS

Key Plan:

NORTH

Date:	MARCH 30, 2022
Drawn By:	DNM
Reviewed By:	RFM
Approved By:	RFM
W&S Project No.:	ENG21-1001
W&S File No.:	TBD

Drawing Title:
ELECTRICAL DETAILS SHEET III

Sheet Number:
E503

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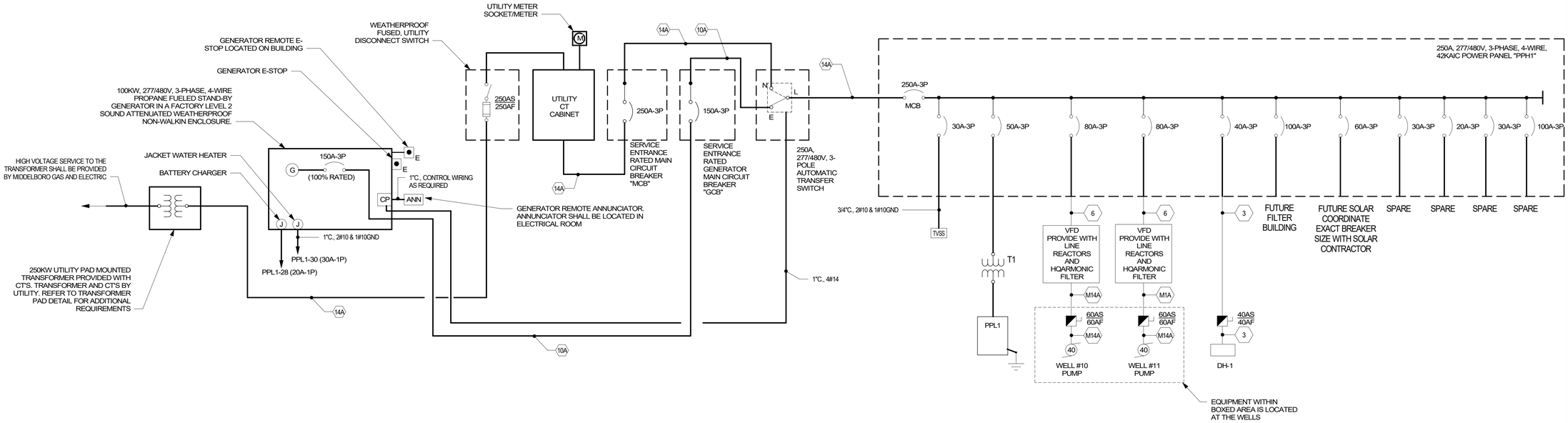
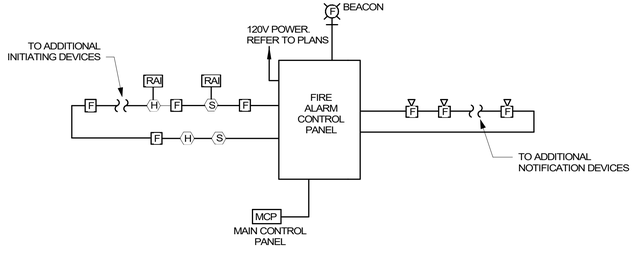
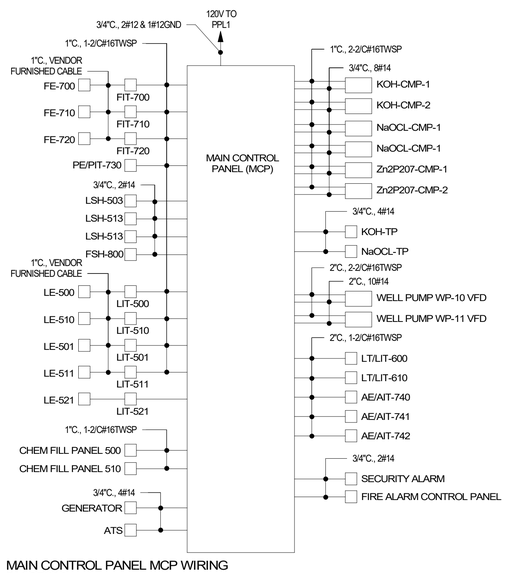


1 ELECTRICAL ONE-LINE RISER DIAGRAM
N.T.S.



2 Fire Alarm Riser Diagram
1/8" = 1'-0"



MAIN CONTROL PANEL MCP WIRING DIAGRAM
NOT TO SCALE

Project:
CHATHAM WATER & SEWER DIVISION
221 CROWELL ROAD CHATHAM, MA 02633

WELL 10 AND 11 PUMPING AND TREATMENT DESIGN MILL HIL ROAD CHATHAM, MA 02633

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Consultants:

Revisions:

No.	Date	Description

COA:

Seal:

COMMONWEALTH OF MASSACHUSETTS
ROBERT F. McALEER
ELECTRICAL
No. 48017
REGISTERED PROFESSIONAL ENGINEER

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ELECTRICAL DIAGRAMS

Sheet Number:
E601

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	LEGEND OF FEEDER SIZES - COPPER CONDUCTORS				
FEEDER SYMBOL	CONDUCTORS (3 PHASE, 3 WIRE) WITH GROUND	RACEWAY SIZE	CONDUCTORS (3 PHASE, 4 WIRE) WITH GROUND	RACEWAY SIZE	NOMINAL AMPERE RATING
1	3#12 & 1#12 GND.	3/4"			20
1A			4#12 & 1#12 GND.	3/4"	
2	3#10 & 1#10 GND.	3/4"			30
2A			4#10 & 1#10 GND.	3/4"	
3	3#8 & 1#10 GND.	1"			40
3A			4#8 & 1#10 GND.	1"	
4	3#6 & 1#10 GND.	1"			60
4A			4#6 & 1#10 GND.	1"	
5	3#4 & 1#8 GND.	1"			70
5A			4#4 & 1#8 GND.	1-1/4"	
6	3#4 & 1#8 GND.	1"			80
6A			4#4 & 1#8 GND.	1-1/4"	
7	3#3 & 1#8 GND.	1-1/4"			90
7A			4#3 & 1#8 GND.	1-1/4"	
8	3#3 & 1#8 GND.	1-1/4"			100
8A			4#3 & 1#8 GND.	1-1/4"	
9	3#1 & 1#6 GND.	1-1/2"			125
9A			4#1 & 1#6 GND.	1-1/2"	
10	3#1/0 & 1#6 GND.	1-1/2"			150
10A			4#1/0 & 1#6 GND.	2"	
11	3#2/0 & 1#6 GND.	2"			175
11A			4#2/0 & 1#6 GND.	2"	
12	3#3/0 & 1#6 GND.	2"			200
12A			4#3/0 & 1#6 GND.	2"	
13	3#4/0 & 1#4 GND.	2"			225
13A			4#4/0 & 1#4 GND.	2-1/2"	
14	3-250 kcmil & 1#4 GND.	2-1/2"			250
14A			4-250 kcmil & 1#4 GND.	3"	
15	3-350 kcmil & 1#4 GND.	3"			300
15A			(4)350 kcmil & 1#4 GND.	3"	
16	3-500 kcmil & 1#3 GND.	3"			350
16A			4-500 kcmil & 1#4 GND.	4"	
17	3-600 kcmil & 1#3 GND.	3"			400
17A			4-600 kcmil & 1#3 GND.	4"	
18	2 SETS OF (250 kcmil & 1#2 GND)	(2) 2-1/2"			500
18A			2 SETS OF (250 kcmil & 1#2 GND)	(2) 4"	
19	2 SETS OF (350 kcmil & 1#1 GND)	(2) 4"			600
19A			2 SETS OF (350 kcmil & 1#1 GND)	(2) 4"	
20	2 SETS OF (3-600 kcmil & 1#1/0 GND.)	(2) 4"			800
20A			2 SETS OF (600 kcmil & 1#1/0 GND)	(2) 4"	

DRY TYPE TRANSFORMER SCHEDULE 480-120/208V								
SIZE	KVA	PRIMARY AMPS	SECONDARY AMPS	480 VOLT OVERCURRENT	208 VOLT OVERCURRENT	480V FEEDER CODE	120/208V FEEDER CODE	GROUND SIZE
T1	30	36	83	50A, 3P	100A, 3P	3/4"C., 3#8 & 1#10GND	1-1/4"C., 4#3 & 1#8GND	#8-1/2"C

PANELBOARD: PPL1

LOCATION: ELEC. ROOM 103
MOUNTING: SURFACE NEMA 1
MAIN DEVICE: 100 A MAIN CB
BUS AMPS: 100 AMPS

VOLTAGE: 208Y/120 V. 3 ø 4 W.
A.I.C. RATING: 10,000 AMPS SYMMETRICAL
SPECIAL:

LOAD DESCRIPTION	BKR	P	CKT	PHASE A kVA		PHASE B kVA		PHASE C kVA		CKT	P	BKR	LOAD DESCRIPTION
Room 103, 102, 5	20 A	1	1	0.8	0.3					2	1	20 A	LITES Room 103, 102
EXTERIOR LIGHTING	20 A	1	3			0.1	0.9			4	1	20 A	RCPT Room 103, 102
RECEPTACLES	20 A	1	5					0.5	0.5	6	1	20 A	RCPT Space 5
RCPT	20 A	1	7	0.4	0.8					8	1	20 A	EF-2 AND MOTORIZED DAMPER (ELEC....
EF-1	20 A	1	9			1.1	0.9			10	1	20 A	GUH-1,GUH-2
GUH-3,GUH-4	20 A	1	11					0.9	0.9	12	2	20 A	EUH-1
GWH-1, EYEWASH SHOWER	20 A	1	13	0.4	0.9					14	--	--	--
NaOCl-CMP-2	20 A	1	15			0.1	0.1			16	1	20 A	NaOCl-CMP-1
NaOCl-TP	20 A	1	17					0.1	0.1	18	1	20 A	KOH-CMP-1
KOH-CMP-2	20 A	1	19	0.1	0.1					20	1	20 A	KOH-TP
Zn2P207-CMP-1	20 A	1	21			0.1	0.1			22	1	20 A	Zn2P207-CMP-2
FACP	20 A	1	23					0.5	0.0	24	1	20 A	MCP
INSTRUMENTS	20 A	1	25	0.3	0.5					26	1	20 A	NaOCL CHEM FILL PANEL
KOH CHEM FILL PANEL	20 A	1	27			0.5	0.0			28	1	20 A	GENERATOR BATTERY CHARGER
Spare	20 A	1	29					0.0	0.0	30	1	30 A	GENERATOR JACKET WATER HEATER
Spare	20 A	1	31	0.0	0.0					32	1	20 A	Spare
Spare	20 A	1	33			0.0	0.0			34	1	20 A	Spare
Spare	20 A	1	35					0.0	0.0	36	1	20 A	Spare
Spare	20 A	1	37	0.0	0.0					38	1	20 A	Spare
Spare	20 A	1	39			0.0	0.0			40	1	20 A	Spare
Spare	20 A	1	41					0.0	0.0	42	1	20 A	Spare
	TOTAL LOAD:			4 kVA		4 kVA		4 kVA					
	TOTAL AMPS:			38 A		32 A		30 A					

LOAD CLASSIFICATION	CONNECTED	DEMAND	ESTIMATED
HVAC	5496 VA	100.00%	5496 VA
Other	355 VA	100.00%	355 VA
RCPT	2340 VA	100.00%	2340 VA
SPEC	1300 VA	100.00%	1300 VA
Lighting	1212 VA	100.00%	1212 VA

PANEL TOTALS	
CONNECTED LOAD:	10663 VA
ESTIMATED DEMAND:	10663 VA
CONNECTED CURRENT:	30 A
EST. DEMAND CURRENT:	30 A

NOTES:

LEGEND OF 480V MOTOR FEEDER SIZES - COPPER CONDUCTORS			
FEEDER SYMBOL	CONDUCTORS (3 PHASE, 3 WIRE) WITH GROUND	RACEWAY SIZE	HP RATING
M1	3#12 & 1#12 GND.	3/4"	1/2
M2	3#12 & 1#12 GND.	3/4"	3/4
M3	3#12 & 1#12 GND.	3/4"	1
M4	3#12 & 1#12 GND.	3/4"	1.5
M5	3#12 & 1#12 GND.	3/4"	2
M6	3#12 & 1#12 GND.	3/4"	3
M7	3#10 & 1#10 GND.	3/4"	5
M8	3#10 & 1#10 GND.	3/4"	7.5
M9	3#10 & 1#10 GND.	3/4"	10
M10	3#8 & 1#8 GND.	3/4"	15
M11	3#6 & 1#8 GND.	1"	20
M12	3#6 & 1#8 GND.	1"	25
M13	3#4 & 1#6 GND.	1-1/4"	30
M14	3#3 & 1#6 GND.	1-1/4"	40
M15	3#1 & 1#6 GND.	1-1/2"	50
M16	3#1/0 & 1#4 GND.	2"	60
M17	3#2/0 & 1#4 GND.	2"	75
M18	3#3/0 & 1#3 GND.	2"	100

LEGEND OF 480V MOTOR FEEDER SIZES - COPPER CONDUCTORS (VFD RATED CABLE)			
FEEDER SYMBOL	CONDUCTORS (3 PHASE, 3 WIRE) WITH GROUND	RACEWAY SIZE	HP RATING
M1A	3#12 & 1#12 GND.	3/4"	1/2
M2A	3#12 & 1#12 GND.	3/4"	3/4
M3A	3#12 & 1#12 GND.	3/4"	1
M4A	3#12 & 1#12 GND.	3/4"	1.5
M5A	3#12 & 1#12 GND.	3/4"	2
M6A	3#12 & 1#12 GND.	3/4"	3
M7A	3#10 & 1#10 GND.	3/4"	5
M8A	3#10 & 1#10 GND.	3/4"	7.5
M9A	3#10 & 1#10 GND.	3/4"	10
M10A	3#8 & 1#8 GND.	3/4"	15
M11A	3#6 & 1#8 GND.	1"	20
M12A	3#6 & 1#8 GND.	1"	25
M13A	3#4 & 1#6 GND.	1-1/4"	30
M14A	3#3 & 1#6 GND.	1-1/4"	40
M15A	3#1 & 1#6 GND.	1-1/2"	50
M16A	3#1/0 & 1#4 GND.	2"	60
M17A	3#2/0 & 1#4 GND.	2"	75
M18A	3#3/0 & 1#3 GND.	2"	100

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	MFR	CATALOG NUMBER	LAMP COLOR	LAMP LUMENS	MOUNTING	VOLTAGE	WATT	NOTE
S1	1 X 4 ENCLOSED AND GASKETED LED FIXTURE WITH INTEGRAL EMERGENCY LED DRIVER	COOPER LIGHTING	4VT2-LD5-8-DR-UNV-EL10W-L835-C D1-WL-U	3500K	8000 lm	SURFACE	120 V	56 W	
S1E	1 X 4 ENCLOSED AND GASKETED LED FIXTURE WITH INTEGRAL EMERGENCY LED DRIVER	COOPER LIGHTING	4VT2-LD5-8-DR-UNV-EL10W-L835-C D1-WL-U	3500K	8000 lm	SURFACE	120 V	30 W	
S2	1X4 SUREFACE MOUNTED LED INSUDTRIAL FIXTURE	COOPER LIGHTING	4SLSTP4035DD-UNV	3500K	4766 lm	SURFACE	120 V	32 W	
S2E	1 X 4 ENCLOSED AND GASKETED LED FIXTURE WITH INTEGRAL EMERGENCY LED DRIVER	COOPER LIGHTING	4SLSTP4035DD-UNV-EBPLED14W	3500K	4766 lm	SURFACE	120 V	30 W	
SW1	WALL MOUNTED EXTERIOR FIXTURE	COOPER LIGHTING	GLEON-SA1-B-740-U-T3-BZ-CBP	4000K	6105 lm	EXTERIOR WALL	120 V	44 W	MOUNT 8'-6" AFG
X1	LED EXIT SIGN. MOUNTING, NUMBER OF FACES AND ARROWS AS SHOWN ON FLOOR PLANS	COOPER LIGHTING	LPX7-SD	-		UNIVERSAL	120 V	5 W	

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ELECTRICAL SCHEDULES SHEET I

Sheet Number:
E602